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SHARP CL20S10 SERVICE MANUAL

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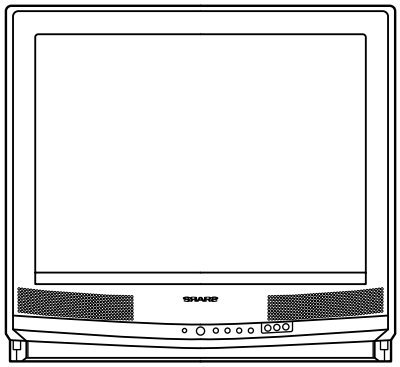
SHARP SERVICE MANUAL

S59G320L-S100



COLOR TELEVISION

Chassis No. SN-80

MODELS **20L-S100S**
CL20S10, 21ML50

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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ELECTRICAL SPECIFICATIONS

POWER INPUT ..... 120 V AC 60 Hz
POWER RATING ..... 88 W
PICTURE SIZE ..... 1,240cm^2 (192sq inch)
CONVERGENCE ..... Magnetic
SWEEP DEFLECTION ..... Magnetic
FOCUS ..... Hi-Bi-Potential Electrostatic
INTERMEDIATE FREQUENCIES
  Picture IF Carrier Frequency ..... 45.75 MHz
  Sound IF Carrier Frequency ..... 41.25 MHz
  Color Sub-Carrier Frequency ..... 42.17 MHz (Nominal)
AUDIO POWER
  OUTPUT RATING ..... 1.3W + 1.3W (at 10% distortion)
SPEAKER
  SIZE ..... 8 cm (Round)
  VOICE COIL IMPEDANCE ..... 8 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE
  VHF/UHF ..... 75 ohm Unbalanced
TUNING RANGES
  VHF-Channels ..... 2 thru 13
  UHF-Channels ..... 14 thru 69
  CATV Channels ..... 1 thru 125 (EIA, Channel Plan U.S.A.)

Specifications are subject to change without prior notice.

SHARP CORPORATION

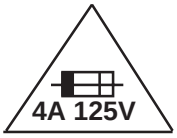
This document has been published to be used for after sales service only.
The contents are subject to change without notice.

IMPORTANT SERVICE SAFETY PRECAUTION

■ **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
   To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.



CAUTION: FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4A-125V FUSE.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the "High Voltage Check" instructions.
   It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter.
   The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and;also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
   Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

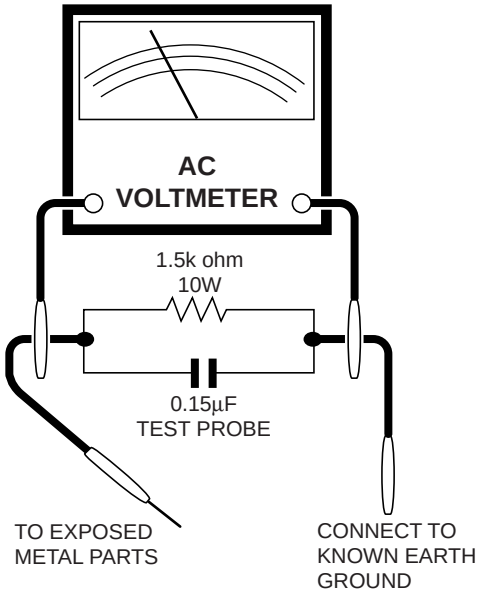
BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC cord directly into a 120 volt AC outlet, (Do not use an isolation transformer for this test).
- Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.
- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.
  AII checks must be repeated with the AC ine cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)
  Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics. These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.
Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

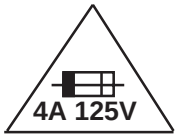
For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

PRECAUTIONS A PRENDRE LORS DE LA REPARATION

■ **Ne peut effectuer la réparation qu' un technicien spécialisé qui s'est parfaitement accoutumé à toute vérification de sécurité et aux conseils suivants.**

AVERTISSEMENT

1. N'entreprendre aucune modification de tout circuit. C'est dangereux.
2. Débrancher le récepteur avant toute réparation.
3. Les déversoirs thermiques à semi-conducteurs peuvent présenter un danger de choc électrique lorsque le réceqteur est en marche.
4. Le châssis de ce récepteur possède deux systèmes de masse qui sont séparées par du matériel d'isolation. Le système de masse non-isolée (sous tension) est pour le circuit du régulateur de tension B+ et le circuit de sortie horizontale. Le système de masse isolée est pour les tensions DC B+ basses et le circuit secondaire du transformateur haute tension. Pour éviter tout risque d'électrocution lors de l'entretien de ce châssis, utiliser un transformateur d'isolation entre le cordon de ligne et la prise de courant.



PRECAUTION: POUR LA PROTECTION CONTINUE CONTRE LES RISQUES D'INCENDIE, REMPLACER LE FUSIBLE PAR UN FUSIBLE DE MEME TYPE 4A-125V.

REPARATION DU SYSTEME A HAUTE TENSION ET DU TUBE-IMAGE

Lors de la réparation de ce systéme, supprimer la charge statique en branchant une résistance de 10 kΩ en série avec un fil isolé (comme une sonde d'essai) entre la mise à la terre du tube-image et le fil d'anodel. (Le corden d'alimentation doit être retiré de la prise murale.)

1. Le tube image dans ce récepteur emploie une protection intégrée contre l'implosion.
2. Par mesure de sécurité, changer le tube-image pour un tube du même numéro de type.
3. Ne pas lever le tube-image par son col.
4. Ne manipuler le tube-image qu'en porant des lunettes incassables et qu'après avoir déchargé totalement la haute tension.

LIMITES DES RADIATIONS X ET DE LA HAUTE TENSION

1. Tout le personnel réparateur doit être instruit des instructions et procédés relatifs aux radiations X.
   Le tube-image, seule source de rayons X dons les téleviseurs transistorisés, n'émet pourtant pas de rayons mesurables si la haute tension est maintenue à un niveau préconisé dans la section "Vérification de la haute tension".
   C'est seulement quand la haute tension est excessive que les rayons X peuvent entrer dans l'enveloppe du tube-image y compris le conducteur de verre. Il est important de maintenir la haute tension en-dessous du niveau spécifié.
2. Il est essentiel que le réparateur ait sous la main un voltmètre à haute tension qui doit être périodiquement étalonné.
3. La haute tension doit toujours être maintenue à la valeur de régime -et pas plus haute. L'opération à des tensions plus élevées peut entraîner une panne du tube-image ou du circuit à haute tension et, dans certaines conditions, peut entraîner une radiation dépassant les niveaux préscrits.
4. Quand le régulateur à haute tension fonctionne correctement, il n'y a aucun problème de radiation X. Chaque fois qu'un châssis couleurs est réparé, la luminosité doit être examinée bout en contrôlant la haute tension à l'aide d'un voltmètre pour s'assurer que la haute tension ne dépasse pas la valeur spécifiée et qu'elle soit correctement réglée.
5. Ne pas utiliser un tube-image autre que celui spécifié et ne pas effectuer de modifications déconseillées du circuit à haute tension.
6. Lors de la recherche des pannes et des mesures d'essai sur un récepteur qui présente une haute tension excessive, éviter de s'approcher inutilement du récepteur.
   Ne pas faire fonctionner le récepteur plus longtemps que nécessaire pour localiser la cause de la tension excessive.

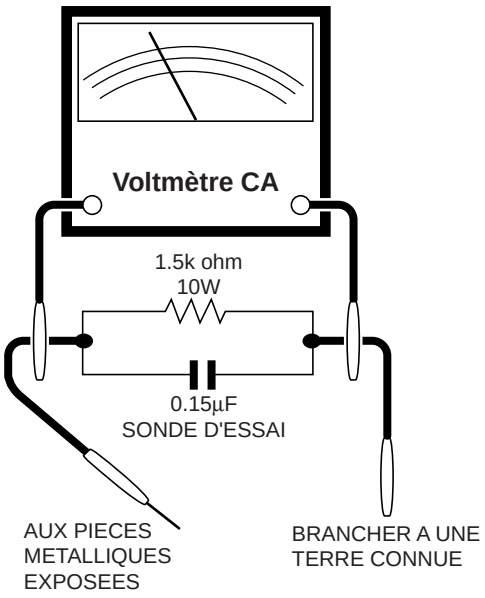
PRECAUTIONS A PRENDRE LORS DE LA REPARATION
(Suite)

VERIFICATIONS CONTRE L'INCEN-DIE ET LE CHOC ELECTRIQUE

Avant de rendre le récepteur à l'utilisateur, effectuer les vérifications suivantes.

1. Inspecter tous les faisceaux de câbles pour s'assurer que les fils ne soient pas pincés ou qu'un outil ne soit pas placé entre le châssis et les autres pièces métalliques du récepteur.
2. Inspecter tous les dispositifs de protection comme les boutons de commande non-métalliques, les isolants, le dos du coffret, les couvercles ou blindages de réglage et de compartiment, les réseaux de résistance-capacité, les isolateurs mécaniques, etc.
3. S'assurer qu'il n'y ait pas de danger d'électrocution en vérifiant la fuite de courant, de la facon suivante:

- Brancher le cordon d'alimentation directem-ent à une prise de courant de 120V. (Ne pas utiliser de transformateur d'isolation pour cet essai).
- A l'aide de deux fils à pinces, brancher une résistance de 1,5 kΩ 10 watts en parallèle avec un condensateur de 0,15µF en série avec toutes les pièces métalliques exposées du coffret et une terre connue comme une conduite électrique ou une prise de terre branchée à la terre.
- Utiliser un voltmètre CA d'une sensibilité d'au moins 5000Ω/V pour mesurer la chute de tension en travers de la résistance.
- Toucher avec la sonde d'essai les pièces métalliques exposées qui présentent une voie de retour au châssis (antenne, coffret métallique, tête des vis, arbres de commande et des boutons, écusson, etc.) et mesurer la chute de tension CA en-travers de la résistance. Toutes les vérifications doivent être refaites après avoir inversé la fiche du cordon d'alimentation. (Si nécessaire, une prise d'adpatation non polarisée peut être utilisée dans le but de terminer ces vérifications.)
  Tous les courants mesurés ne doivent pas dépasser 0,5 mA.
  Dans le cas contraire, il y a une possibilité de choc électrique qui doit être supprimée avant de rendre le récepteur au client.

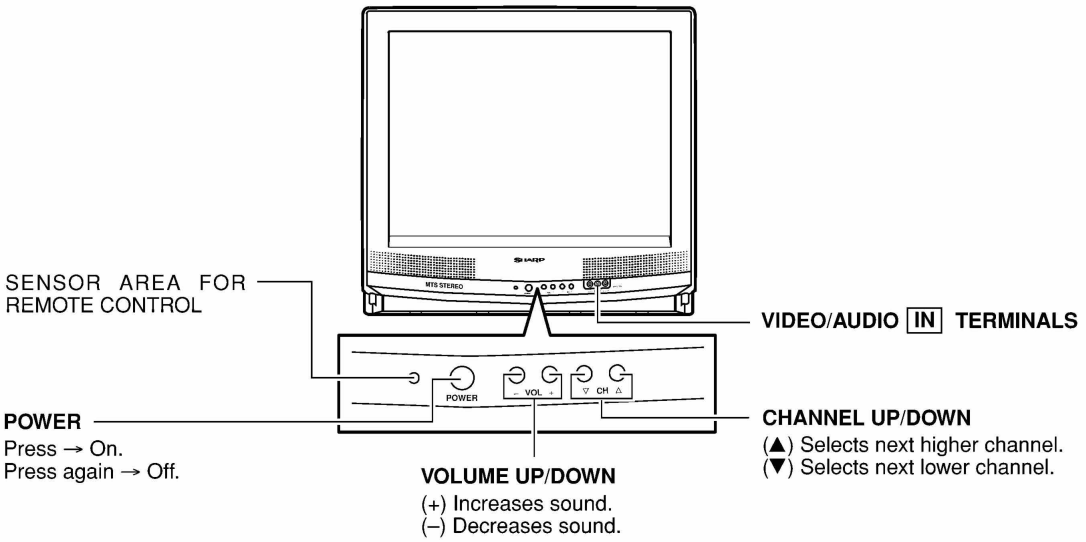


AVIS POUR LA SECURITE

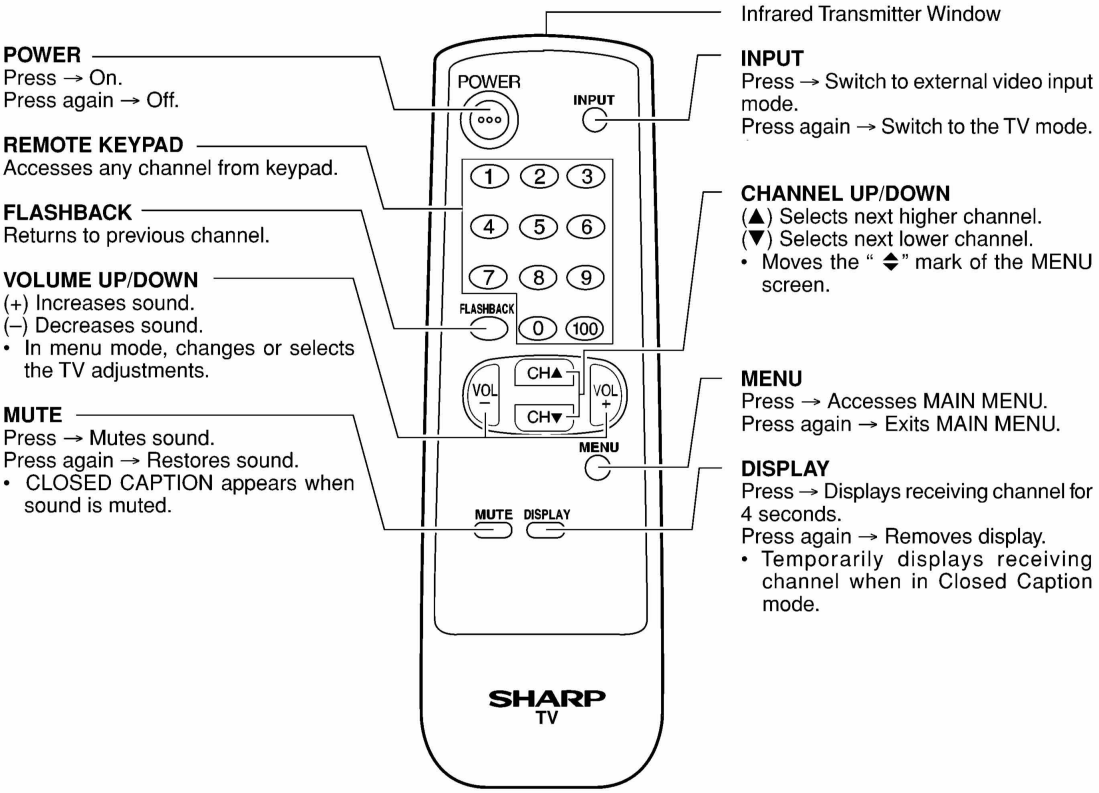
De nombreuses pièces, électriques et mécaniques, dans les téléviseurs présentent des caractéristiques spéciales relatives à la sécurité, qui ne sont souvent pas évidentes à vue. Le degré de protection ne peut pas être nécessairement augmentée en utilisant des pièces de remplacement étalonnées pour haute tension, puissance, etc.
Les pièces de remplacement qui présentent ces caractéristiques sont identifiées dans ce manuel; les pièces électriques qui présentent ces particularités sont identifiées par la marque "⚠" et hachurées dans la liste des pièces de remplacement et les diagrammes schématiques.
Pour assurer la protection, ces pièces doivent être identiques à celles utilisées dans le circuit d'origine. L'utilisation de pièces qui n'ont pas les mêmes caractéristiques que les pièces recommandées par l'usine, indiquées dans ce manuel, peut provoquer des électrocutions, incendies, radiations X ou autres accidents.

LOCATION OF USER'S CONTROL

Front Panel



Basic Remote Control Functions


Infrared Transmitter Window
POWER
Press → On.
Press again → Off.
REMOTE KEYPAD
Accesses any channel from keypad.
FLASHBACK
Returns to previous channel.
VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.
• In menu mode, changes or selects the TV adjustments.
MUTE
Press → Mutes sound.
Press again → Restores sound.
• CLOSED CAPTION appears when sound is muted.
INPUT
Press → Switch to external video input mode.
Press again → Switch to the TV mode.
CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.
• Moves the " ⬍ " mark of the MENU screen.
MENU
Press → Accesses MAIN MENU.
Press again → Exits MAIN MENU.
DISPLAY
Press → Displays receiving channel for 4 seconds.
Press again → Removes display.
• Temporarily displays receiving channel when in Closed Caption mode.
SHARP
TV

INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
(2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 4.0A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 120V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads 22.2 ±1.5V.
5. Apply external 28.9V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 120V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Enter the service mode and select the service adjustment "S19" and Bus data "01" (Y-mute on).
4. The voltage should be approximately, 27.0kV (at zero beam).
   If a correct reading cannot be obtained, check circuitry for malfunctioning components. After the voltage test, make Y-mute off to the normal mode.

For adjustments of this model, the bus data is converted to various analog signals by the D/A converter circuit.

Note: There are still a few analog adjustments in this series such as focus and master screen voltage. Follow the steps below whenever the service adjustment is required. See "Table-B" to determine, if service adjustments are required.

1. Service mode

Before putting unit into the service mode, check that customer adjustments are in the normal mode. Use the reset function in the video adjustment menu to ensure customer controls are in their proper (reset) position.

2. Service number selection

Once in the service mode, press the Ch-up or Ch-down button on the remote controller or at the set. The service adjustment number will vary in increments of one, from "S01" to "M05". Select the item you wish to adjust.

3. Data number selection

Press the Vol-up or down button to adjust the data number.

To enter the service mode and exit service mode.

While pressing the Vol-up and Ch-up buttons at the sametime, plug the AC cord into a wall socket.
Now the TV set is switched on and enters the service mode.
To exit the service mode, turn the television off by pressing the power button.

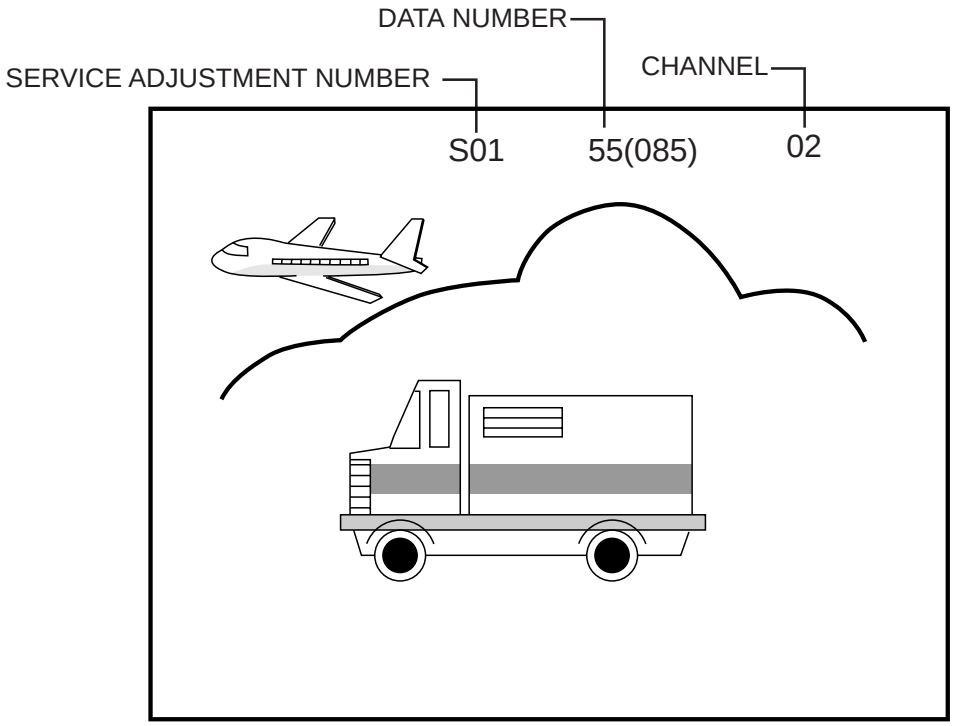


Figure A.

SERVICE NUMBER	ADJUSTMENT ITEM	DATA		ADJUSTMENT CONTENTS
		INITIAL VALUE	RANGE	
S01	PICTURE	55	00-7F	
S02	TINT	46	00-7F	
S03	COLOR	32	00-7F	
S04	BRIGHTNESS	40	00-7F	
S05	SHARPNESS	28	00-3F	Must be set to "24"
S06	VERTICAL PHASE	00	00-07	Must be set to "00" ~ "03"
S07	HORIZONTAL PHASE	12	00-1F	
S08	RF-AGC	23	00-3F	
S09	VERTICAL AMP	20	00-3F	
S10	VCO	2C	00-7F	
S11	R CUT-OFF	00	00-FF	
S12	G CUT -OFF	00	00-FF	
S13	B CUT-OFF	00	00-FF	
S14	G GAIN	7F	00-FF	
S15	B GAIN	7F	00-FF	
S16	TRAP(3.58MHz)	00	00 or 01	Must be set to "00"
S17	BALANCE	20	00-3F	Must be set to "20"
S18	C.C.POSITION	17	00-7F	
S19	Y-MUTE	00	00,01,03	"00" = Normal, "01" = No-Y, "03" = No Vertical
S20	ENERGY SAVE OFFSET	20	00-3F	Must be set to "23"
S21	D.D.E. OFFSET	03	00-1F	Must be set to "03"
S22	OSD SETUP	00	00-03	Must be set to "00"
S23	TUNER SETUP	00	00-01	Must be set to "00"
OP	OPTION	30	00-FF	Must be set to "06"
M01	MTS LEVEL	0A	00-F	
M02	STERO-VCO	20	00-3F	
M03	FILTER	1C	00-3F	
M04	LOW SEPARATION	20	00-3F	
M05	HIGH SEPARATION	1B	00-3F	

Table - A

Holding down both the CH-up/down buttons on the TV set at service mode for more than 2 seconds will automatically write the above initial values into IC2101.

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC2001		X	Data is stored in IC2101.
IC201	X		The adjustment is needed to compensate for characteristics of parts including IC201.
IC2101	X		Holding down both the CH-up/down buttons on the TV set in the service mode for more than 2 seconds will automatically write the above initial values into IC2101.
CRT	X		Adjust items related to picture tube only.

Table - B

■ SERVICE ADJUSTMENT

VCO Adjustment

1. Connect a digital voltmeter between pin (44) of IC201 and ground.
2. Receive a good local channel.
3. Enter the service mode and select the service adjustment "S10".
4. Adjust the data so that digital voltmeter reads 2.2V.
5. Adjustment is completed, remove the voltmeter, return to "normal" mode.

RF AGC Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S08".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.
   Note 1 : You will have to come out of the service mode to select another channel.
   Note 2 : Setting the data to "00" will produce a black raster.

Screen Adjustment

1. Connect a digital voltmeter between TP852 and TP853 on the CRT Unit.
   Note: These test points may not be provided. Then connect the voltmeter to both ends of R852 located near Q852 on the foil side.
2. Receive a good local channel.
3. Enter the service mode and select the service adjustment "S03" and set the data value to "00" to set the color level to minimum. (Record original data code under adjustment "S03" before changing) You may skip this step, if you selected a B/W picture or monoscope pattern.
4. Select the service adjustment "S19" and adjust the data value to "01", this turn off the luminance signal (Y-mute).
5. Select the service adjustment "S04" and adjust data value to obtain 0.17 volts on the digital voltmeter.
6. Adjust the master screen control until the raster darkens to the point where raster is barely seen.
7. Adjust the service adjustments "S11" red, "S12" green and "S13" blue to obtain a good grey scale with normal whites at low brightness level.
8. Select the service adjustment "S19" and reset data to "00". Select the service adjustment "S03" and reset data to obtain normal color level.
9. Remove digital voltmeter, and reset the master screen control to obtain normal brightness range.

White Balance Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S03" and set to "00" (minimum color)(Record original data code under adjustment "S03" before changing). "S03" does not have to be adjusted, if you selected a B/W picture or monoscope pattern.
3. Alternately adjust the service adjustment data of "S14" and "S15" until a good grey scale with normal whites is obtained.
4. Select the service adjustment "S03" and adjust data to obtain normal color level.

Sub-Picture Adjustment

1. Receive a good local channel.
2. Make sure the customer picture control is set to maximum.
3. Enter the service mode and select the service adjustment "S01".
4. Adjust the data value to achieve normal contrast range.

Sub-Tint Adjustment

1. Receive a good local channel.
2. Set customer tint control to center of it's range.
3. Enter the service mode and select the service adjustment "S02".
4. Adjust "S02" data value to obtain normal flesh tones.

Sub-Color Adjustment

1. Receive a good local channel.
2. Make sure the customer color control is set to center position .
3. Enter the service mode and select the service adjustment "S03".
4. Adjust "S03" data value to obtain normal color level.

Sub-Brightness Adjustment

1. Receive a good local channel.
2. Make sure the customer brightness control is set to center position.
3. Enter the service mode and select the service adjustment "S04".
4. Adjust "S04" data value to obtain normal brightness level.

Vertical-Size Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S09".
3. While observing the top and bottom of the screen, adjust "S09" data value to proper vertical size.

Vertical Phase Adjustment

1. Enter the service mode and select the service adjustment "S06".
2. Adjust data value to "00" ~ "03".
   Note: This must be set "00" ~ "03" when changed data retrace line will appear.

Horizontal Position Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S07".
3. Adjust "S07" data value so that picture is centered.

Caption Position Adjustment (Horizontal)

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S18".
3. A black text box appears on the screen. (see **Figure B** below)
4. Adjust "S18" data value so that text box is positioned in the center of the screen.

3.58MHz Trap Adjustment

1. Receive a good local channel.
2. Enter the service mode and select the service adjustment "S16".
3. This is a two position adjustment, "00" is ON, "01" is OFF.
4. Adjust data value to "00" for normal viewing.

Sharpness, Audio Balance, Energy Save Offset, DDE Offset, OSD Setup, Tuner Setup and Option Adjustments

1. Receive a good local channel.
2. Enter the service mode and select the service adjustments "S05" for sharpness, "S17" for balance, "S20" for energy save offset, "S21" for DDE offset, "S22" for OSD setup, "S23" for tuner and "OP" for option.

- **Sharpness Adjustment**

3. Adjust data value to "24" (center of data range) for sharpness adjustment.

- **Audio Balance Adjustment**

4. Adjust data value to "20" (center of data range) for Audio balance adjustment.

- **Energy Save Offset Adjustment**

5. Adjust data value to "23".

- **DDE Offset Adjustment**

6. Adjust data value to "03".

- **OSD Setup Adjustment**

7. Adjust data value to "00".

- **Tuner Setup Adjustment**

8. Adjust data value to "00".

- **Option Adjustment**

9. Adjust data value to "06".

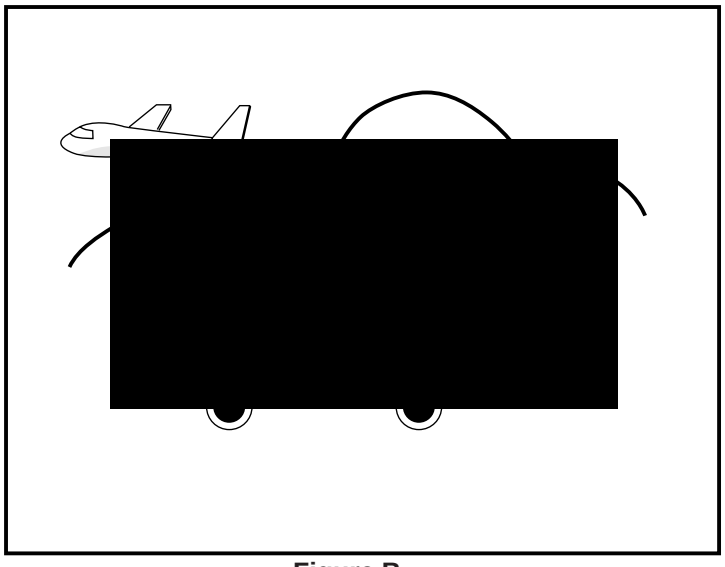


Figure B.

■ MTS ADJUSTMENT

MTS Level Adjustment

1. Feed the following monaural signal to pin (14) of IC3001.
   Monaural signal : 300Hz, 245mVrms
2. Connect the rms voltmeter to pin (39) of IC3001.
3. Enter the service mode and select the service adjustment "M01".
4. Adjust the data so that the rms voltmeter reads. 490 ±10mVrms.

MTS VCO Adjustment

1. Keep the unit in no-signal state.
2. Connect the frequency counter to pin (39) of IC3001.
3. Connect a capacitor (100µF, 50V) in between positive(+) side of C3005 and ground.
4. Enter the service mode and select the service adjustment "M02"
5. Adjust the data so that the frequency counter reads. 62.94 ±0.75kHz.

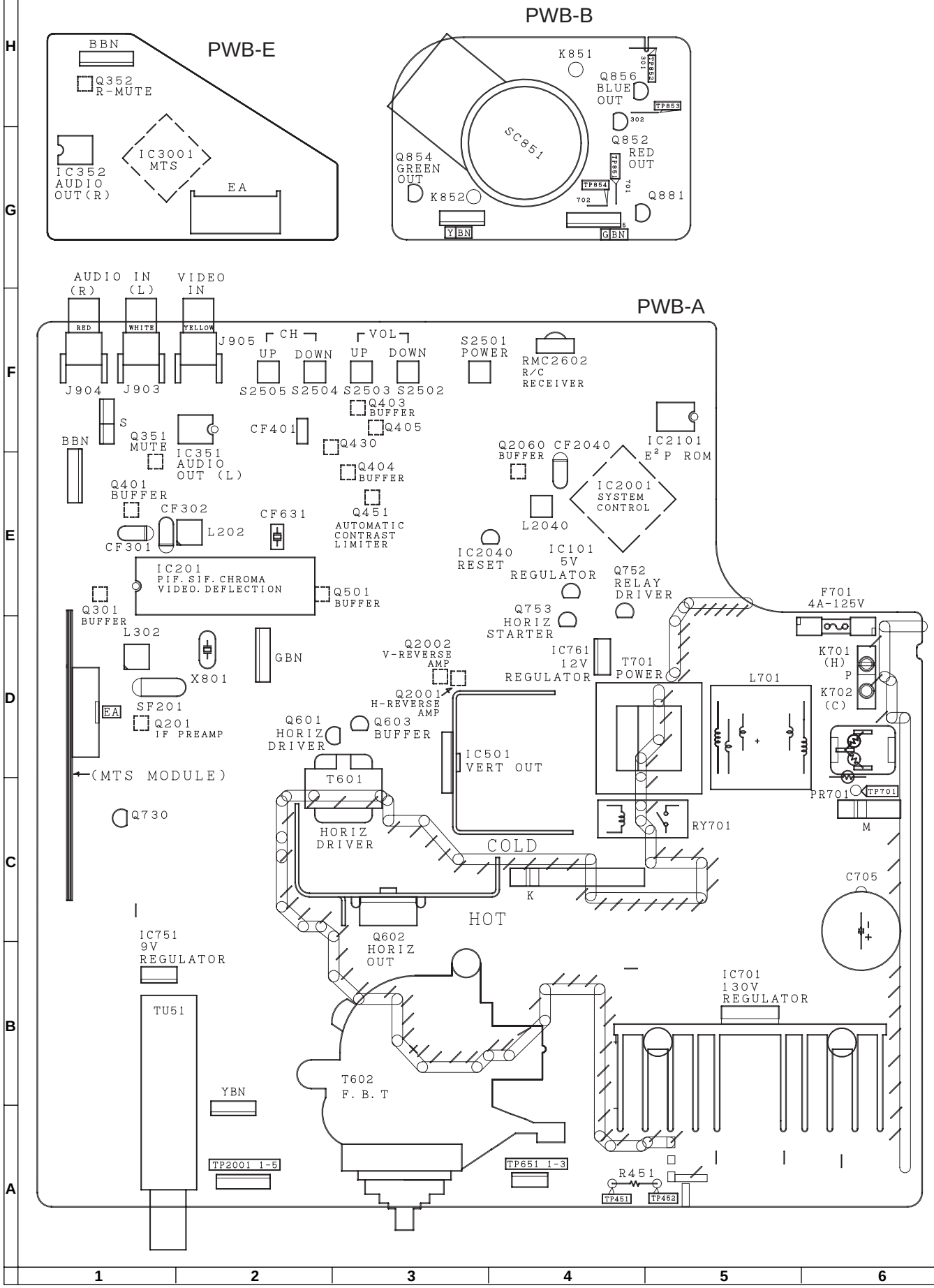
Filter Adjustment

1. Feed the following stereo pilot signal to pin (14) of IC3001 .
   Stereo pilot signal: 9.4kHz, 600mVrms.
2. Enter the service mode and select the service adjustment "M03".
3. Adjust the data at the point where "OK" appears on the screen. The "OK" represents the approximate center of the adjustable range of the data.

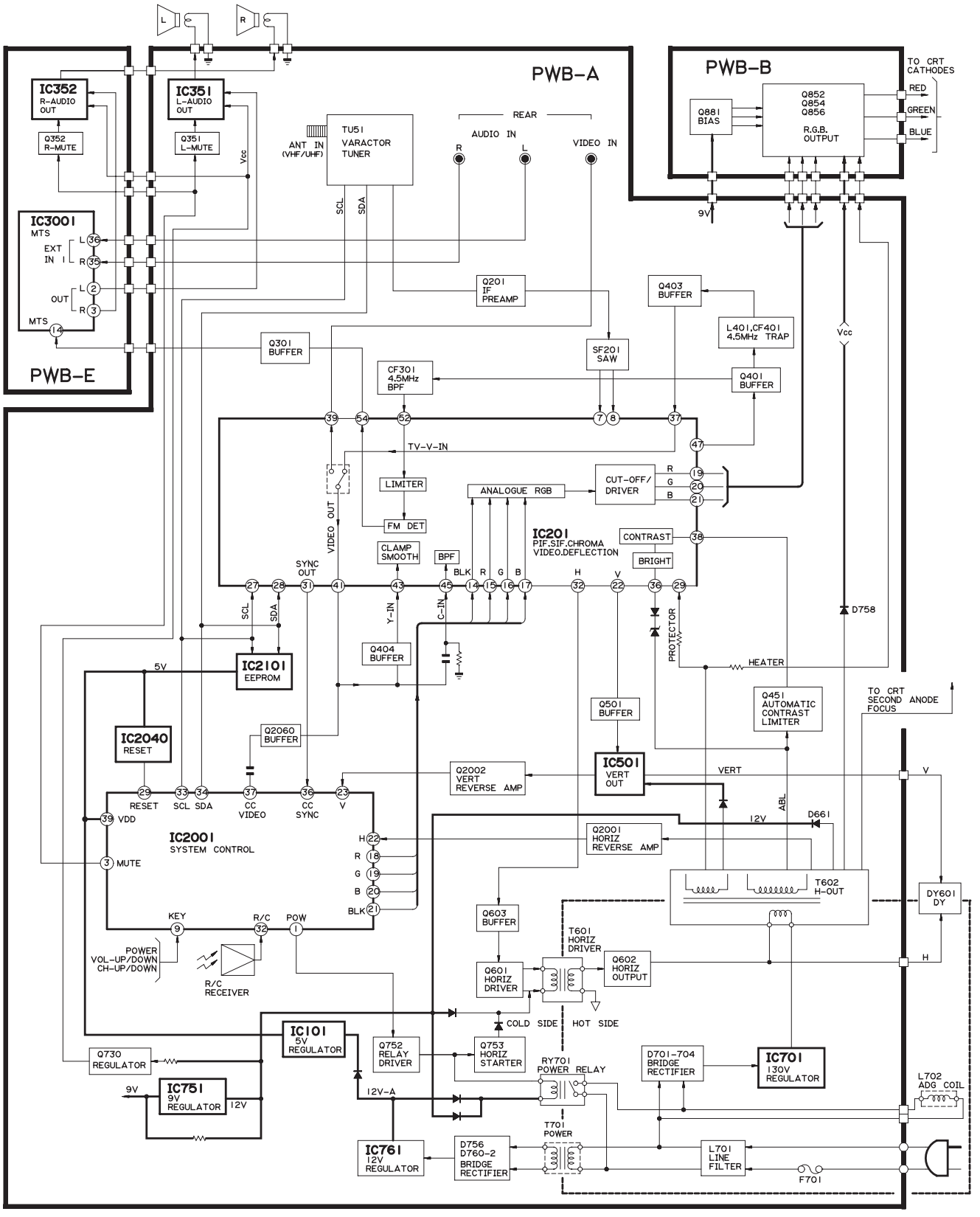
Separation Adjustment

1. Connect the rms voltmeter to pin (39) of IC3001.
2. Receive the following composite stereo signal 1.
   Composite stereo signal: 30% modulation, left channel only, noise reduction on, 300Hz
3. Enter the service mode and select the service adjustment "M04".
4. Adjust the data until the AC voltage reading of the rms voltmeter is minimum.
5. Receive the following composite stereo signal 2.
   Stereo signal: 30% modulation, left channel only, noise reduction on, 3kHz
6. Enter the service mode and select the service adjustment "M05".
7. Adjust the data until the AC voltage reading of the rms voltmeter is minimum.
8. Take the above steps 1 thru 7 again for fine adjustment.

CHASSIS LAYOUT



BLOCK DIAGRAM



DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:

1. *The unit of resistance "ohm" is omitted. (K=kΩ=1000Ω, M=MΩ)*
2. *All resistors are 1/16 watt, unless otherwise noted.*
3. *All capacitors are μ F, unless otherwise noted. (P=pF=μμF)*
4. *(G) indicates ±2% tolerance may be used.*
5. ⏚ *indicates line isolated ground.*
6. ⏚ *indicates hot ground.*

VOLTAGE MEASUREMENT CONDITIONS:

1. *All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.*
2. *All voltages measured with 1000μ V B & W or Color signal.*

WAVEFORM MEASUREMENT CONDITIONS:

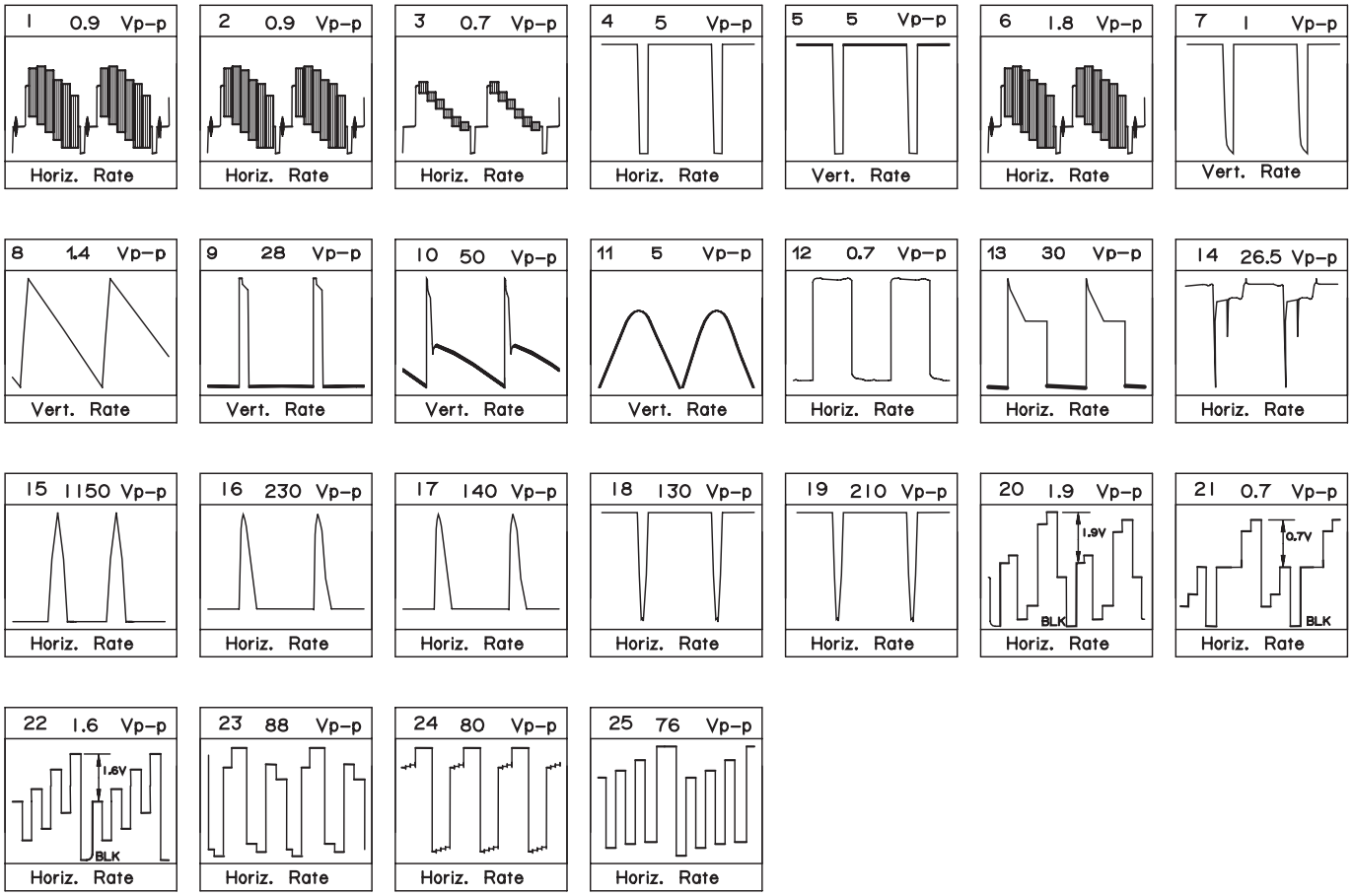
1. *Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.*
2. ◯▶ *indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)*

⚠ *AND SHADED ( ) COMPONENTS = SAFETY RELATED PARTS.*
▲ *MARK= X-RAY RELATED PARTS.*

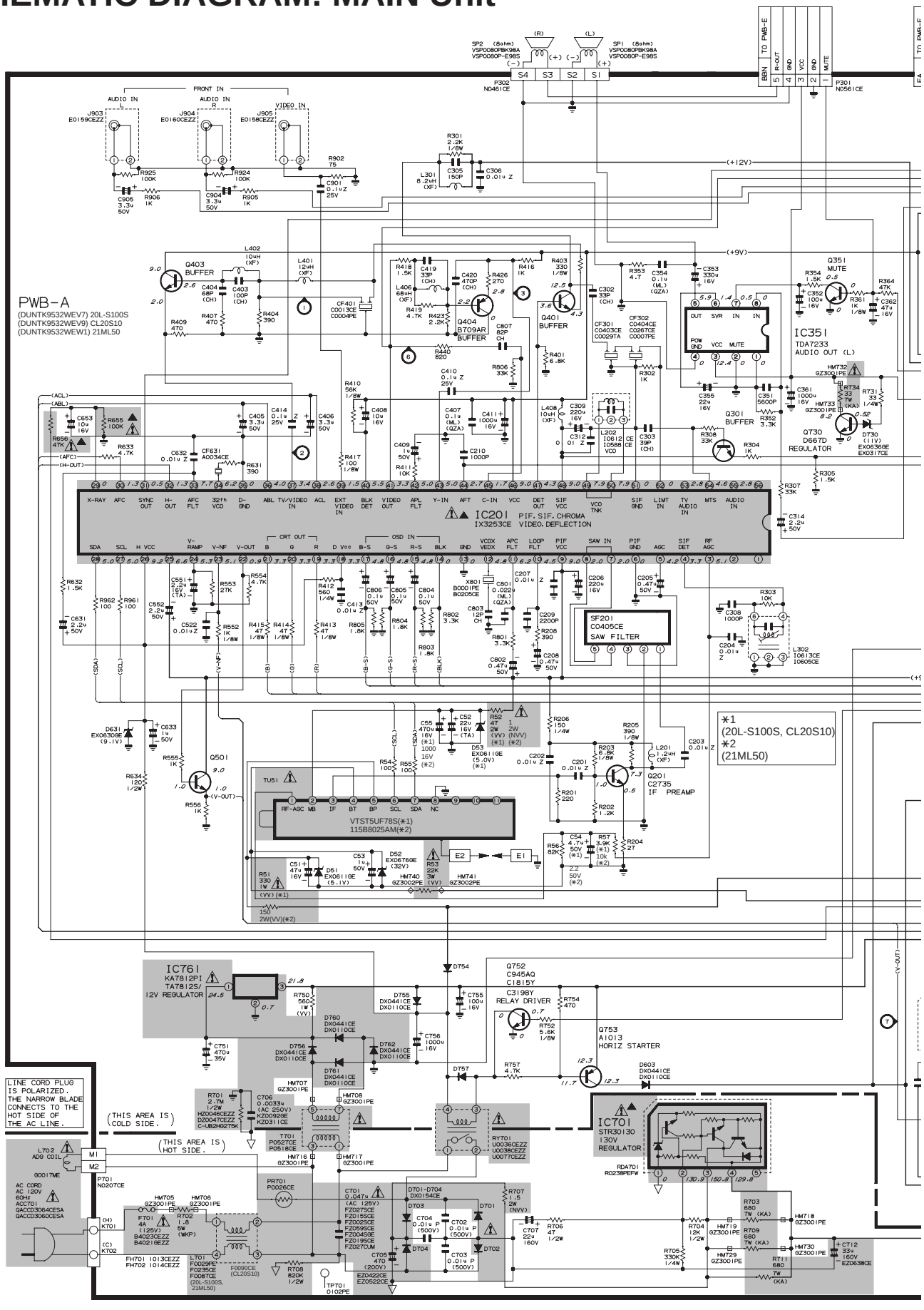
DRGANNES MARQUES ⚠ ET HACHRES ( ): PIECES RELATIVES A LA SECURITE.
MARQUE ▲ : PIECS RELATIVE AUX RAYONS X.

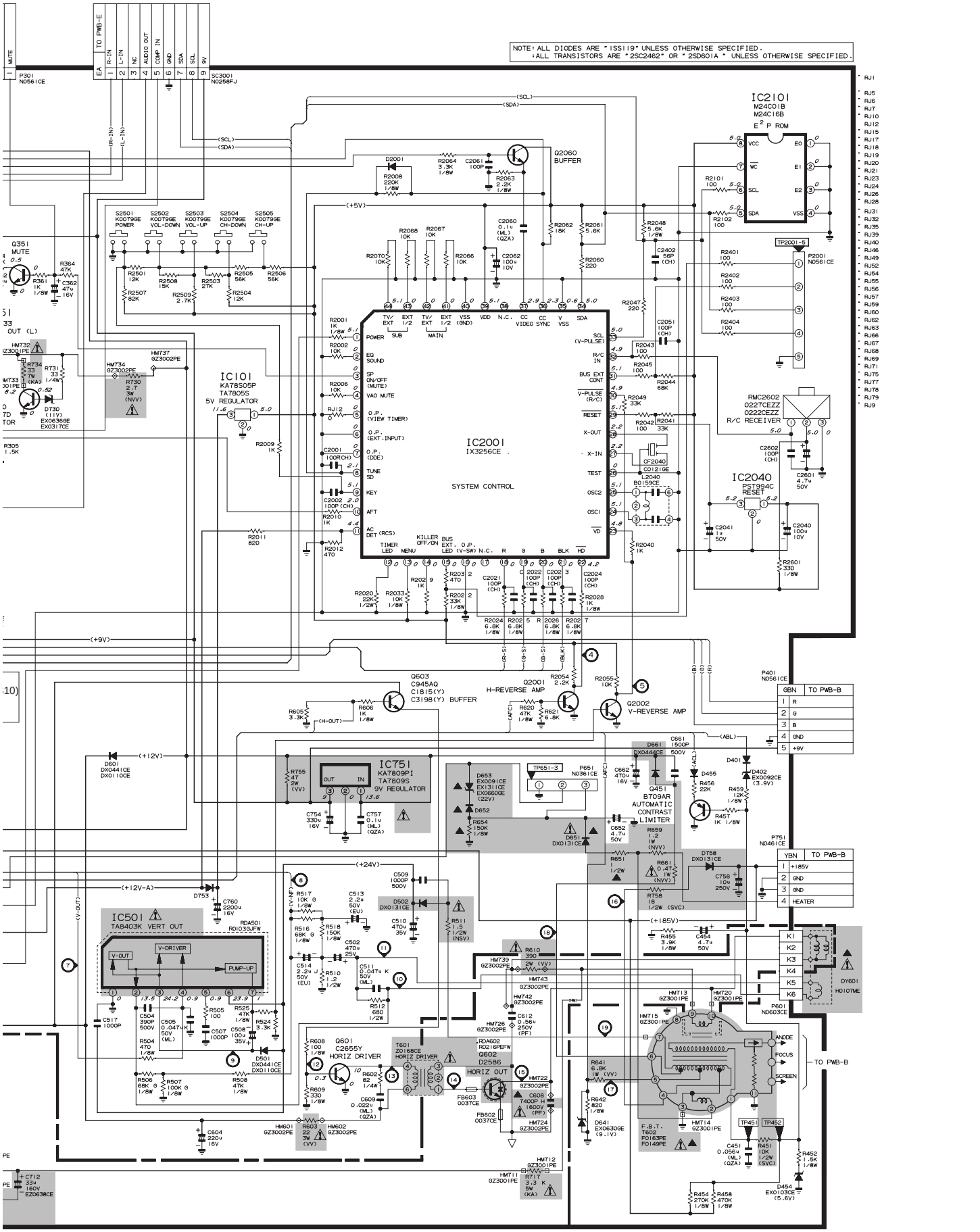
This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

WAVEFORMS



SCHEMATIC DIAGRAM: MAIN Unit

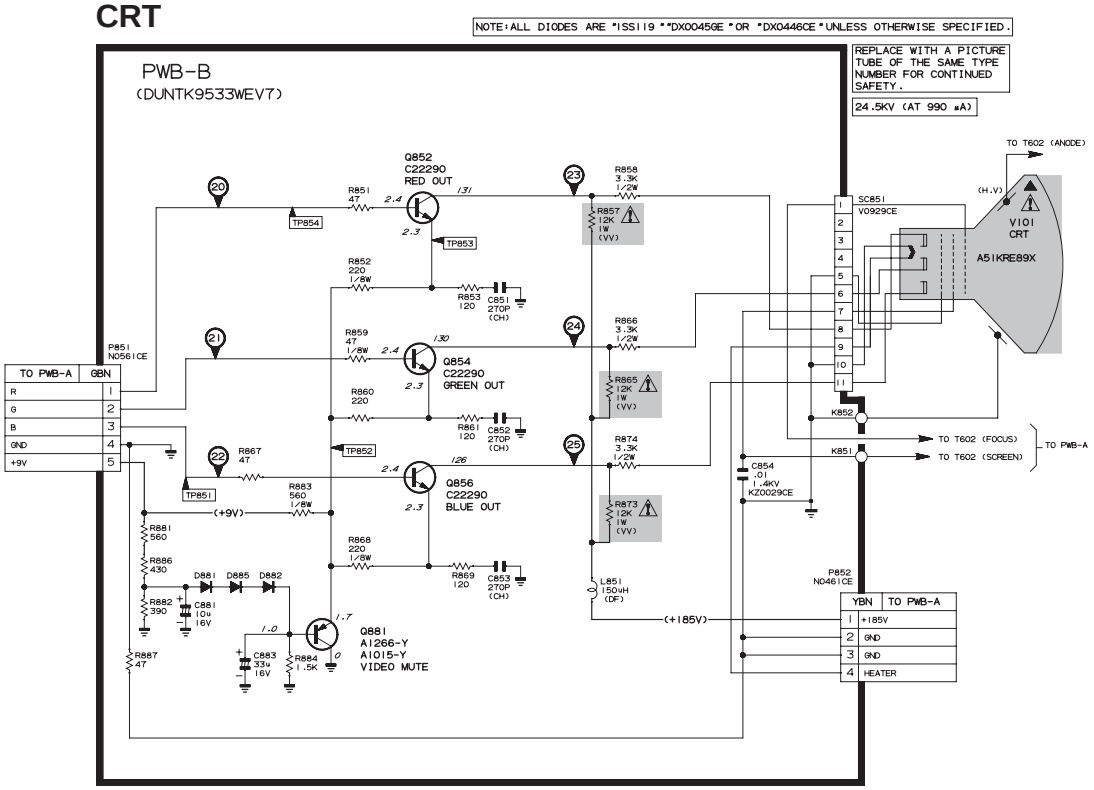




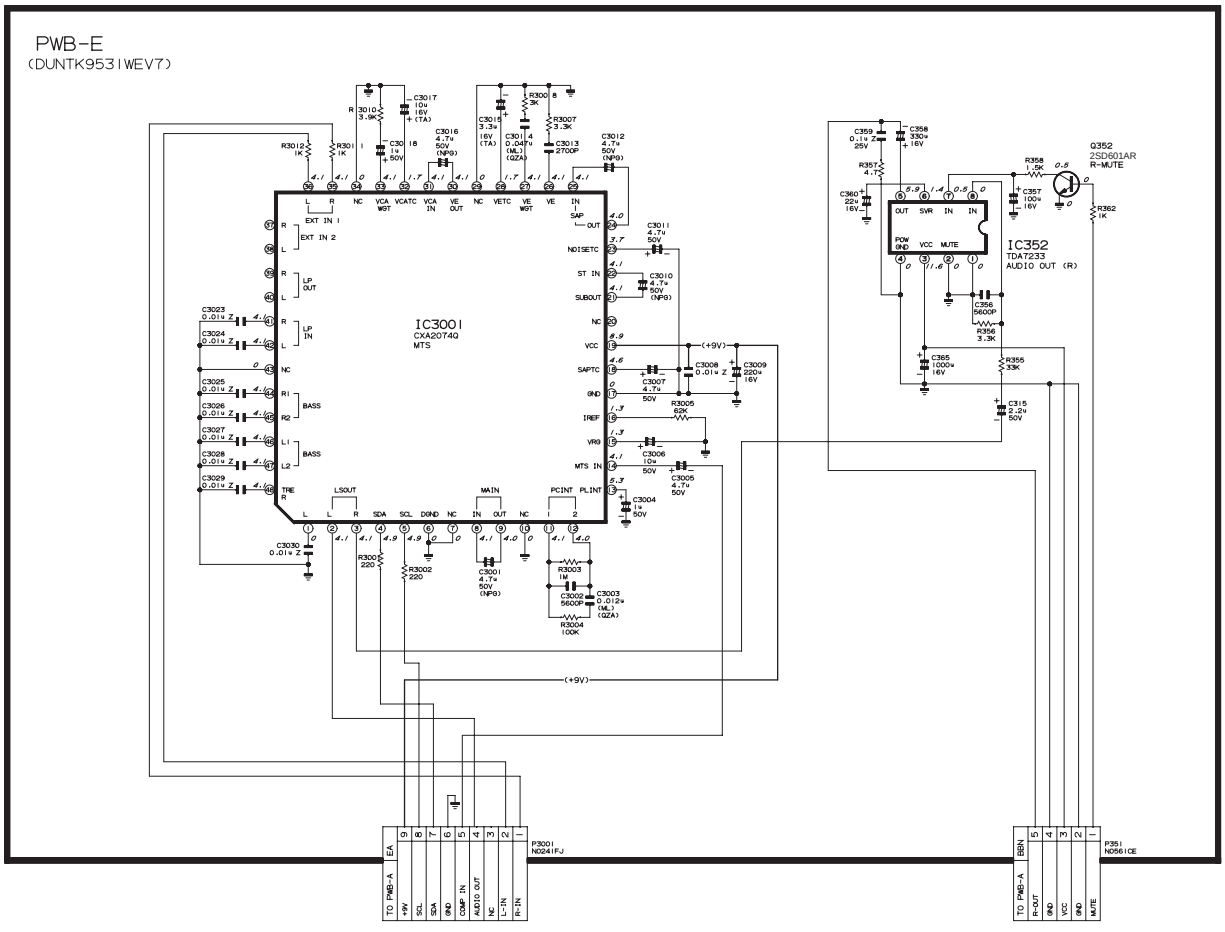
10	11	12	13	14	15	16	17	18	19

SCHEMATIC DIAGRAM: CRT and MTS MODULE Unit

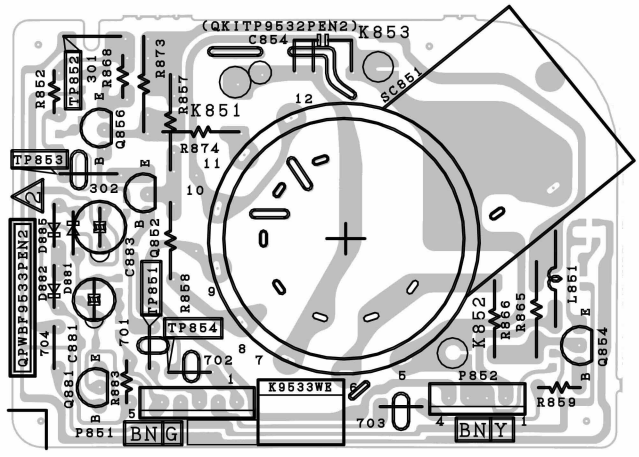
CRT



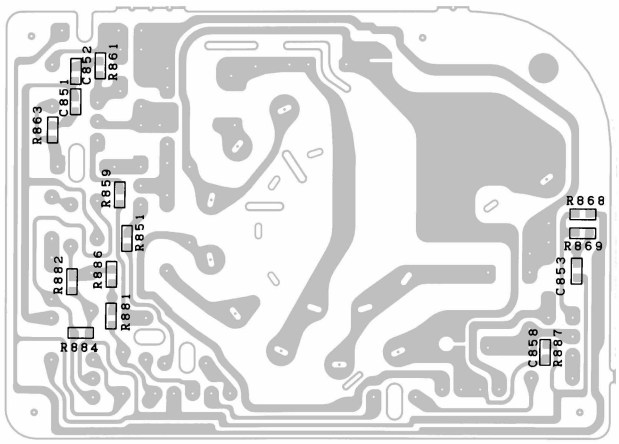
MTS MODULE



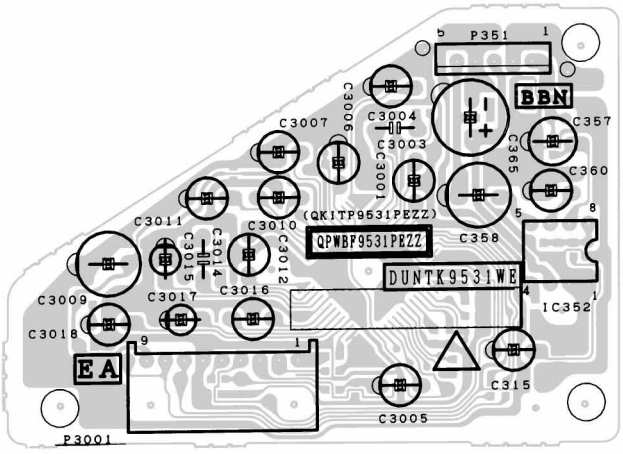
PRINTED WIRING BOARD ASSEMBLIES



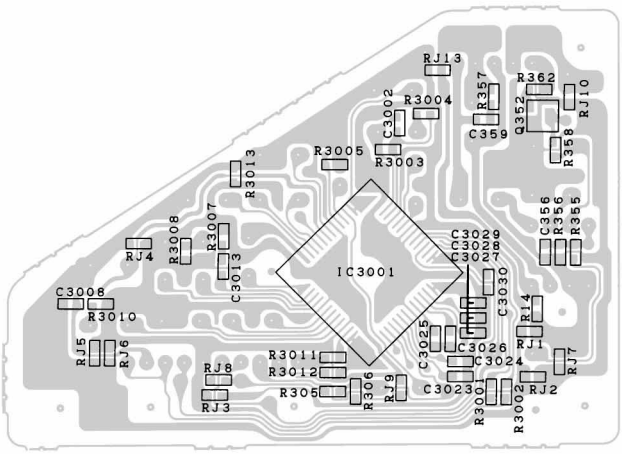
PWB-B: CRT Unit (Wiring Side)



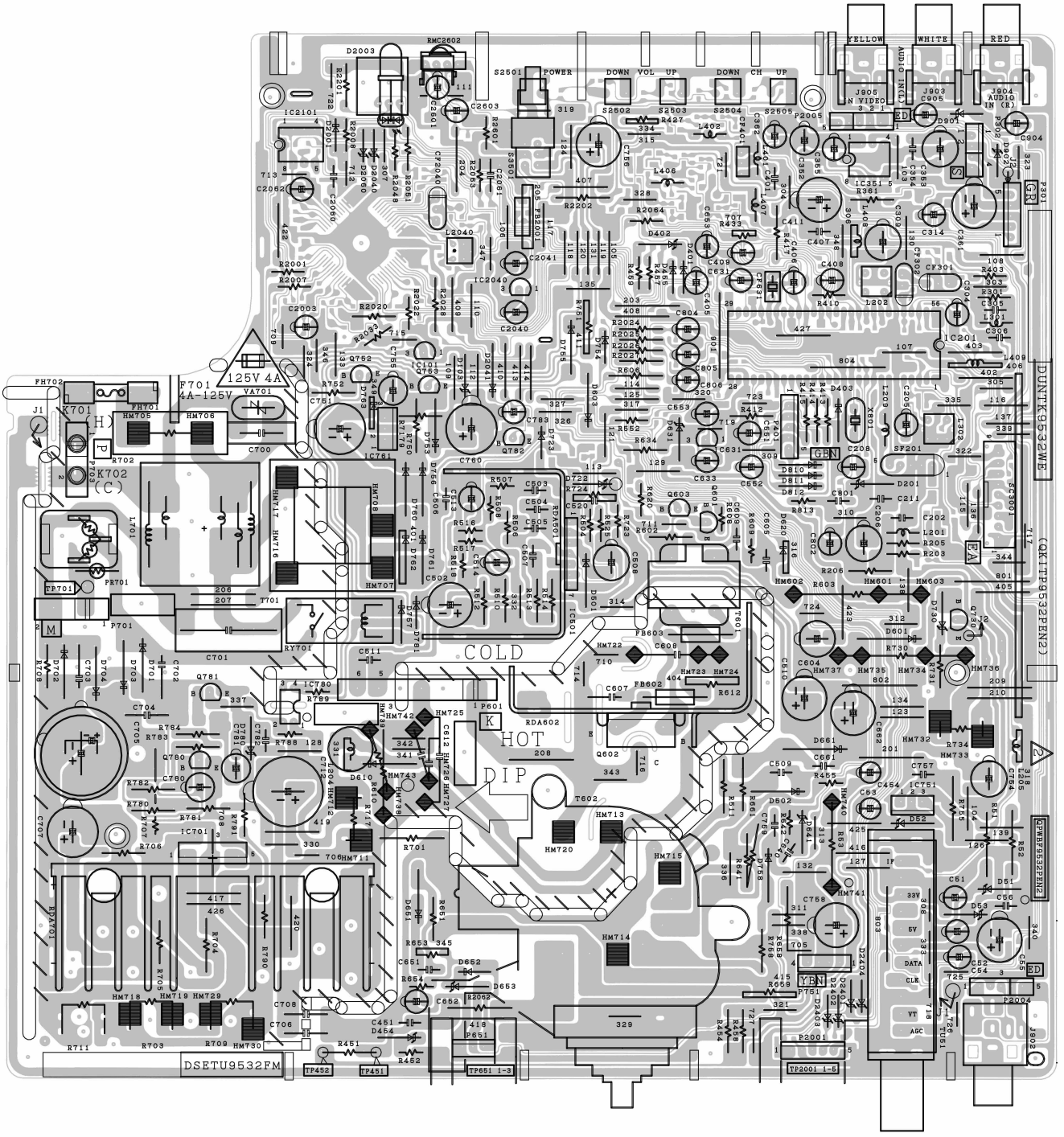
PWB-B: CRT Unit (Chip Parts Side)



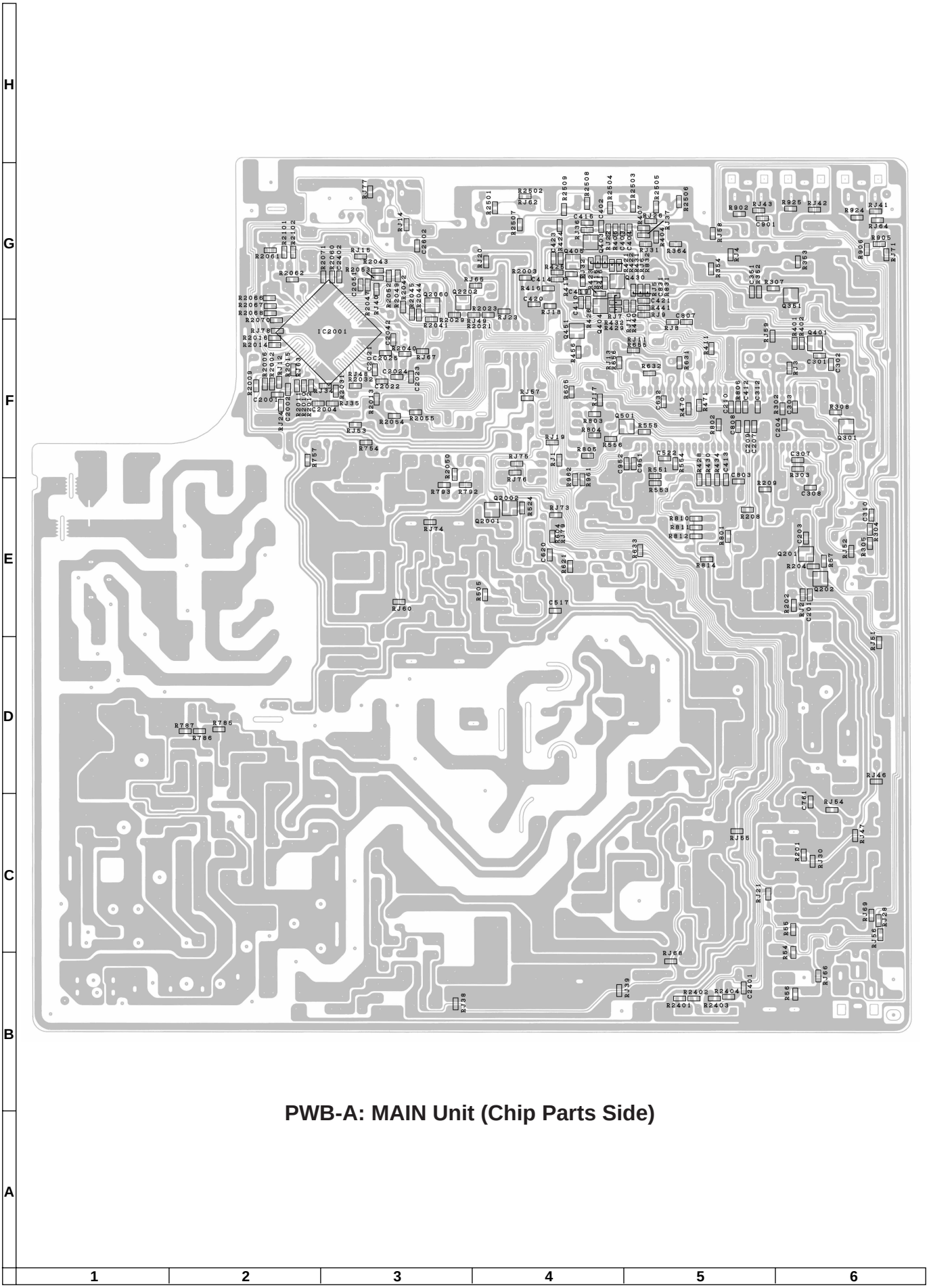
PWB-E: MTS MODULE Unit
(Wiring Side)



PWB-E: MTS MODULE Unit
(Chip Parts Side)



PWB-A: MAIN Unit (Wiring Side)



PWB-A: MAIN Unit (Chip Parts Side)

PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which dose no have the same safety characteristic as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

in **USA**: Contact your nearest SHARP Parts Distributor to order. For location of SHARP Parts Distributor, Please call Toll-Free; 1-800-BE-SHARP

★ MARK: SPARE PARTS-DELIVERY SECTION

▲ MARK: X- RAY RELATED PARTS

LISTE DES PIECES

CHANGE DES PIECES

Les pi`eces de rechange qui pr élelesentent ces caract éleristiques sp éleciales de s élecurit éle, sont identifi élees dans ce manuel : les pi`eces élelectriques qui pr élesentent ces particularit éles, sont rep éler élee par la marque ⚠ et sont hachur élees dans les listes de pi`eces et dans les diagrammes sch élematiques.
La substitution d'une pi`ece de rechange par une autre qui ne pr éLesente pas les m éoemes caract éLeristiques de s élecurit éle que la pi`ece recommand élee parl'usine et dans ce manuel de service, peut provoquer une éLelectrocution, un incendie ou toutautre sinistre.

"COMMENT COMMANDER LES PIECES DE RECHANGE"

Pour que votre commande soit rapidement et correctement remplie, veuillez fournir les renseignements suivants.

1. NUMERO DU MODELE
2. NO. DE REF
3. NO. DE PIECE
4. DESCRIPTION

in **CANADA**: Contact SHARP Electronics of Conada Limited
Phone (416) 890-2100

★MARQUE: SECTION LIVRAISON DES PIECES DE RECHANGE

▲ MARQUE: PIECES RELATIVE AUX RAYONS X

PICTURE TUBE

Ref. No.	Part No.	★	Description	Code
▲⚠ V101	VB51KRE89X/1E	M	Picture Tube	CC
▲⚠ DY601	RCiLH0107MEZZ	M	Deflection Yoke	AE
⚠ L702	RCiLG0017MEZZ	M	Degaussing Coil	AM
	MSPRT0002MEZZ	M	Spring for CRT (20L-S100S)	AA
	PMAGF3003CEZZ	J	Magnet Ass'y	AK
	QEARC2002MEZZ	M	Ground Part (20L-S100S)	AF
	QEARC2119PEZZ	R	Ground Part (CL20S10, 21ML50)	

PRINTED WIRING BOARD ASSEMBLIES
(NOT REPLACEMENT ITEM)

PWB-A	DUNTK9532WEV7	–	Main Unit (20L-S100S)	—
PWB-A	DUNTK9532WEV9	–	Main Unit (CL20S10)	—
PWB-A	DUNTK9532WEW1	–	Main Unit (21ML50)	—
PWB-B	DUNTK9533WEV7	–	CRT Unit	—
PWB-E	DUNTK9531WEV7	–	MTS Module Unit	—

PWB-A:DUNTK9532WEV7 (20L-S100S)
PWB-A:DUNTK9532WEV9 (CL20S10)
PWB-A:DUNTK9532WEW1(21ML50)
MAIN UNIT

TUNER

NOTE : THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.

Ref. No.	Part No.	★	Description	Code
⚠ TU51	VTUVTST5UF78S	M	Tuner (20L-S100S, CL20S10)	AX
⚠ TU51	VTU115B8025AM	M	Tuner (21ML50)	BA

INTEGRATED CIRCUITS

IC101	VHiKA78S05P-1 or VHiTA7805S/-1	J	KIA78S05P	AD
▲⚠ IC201	RH-iX3253CEZZ	J	TA1268AN	AV
IC351	VHiTDA7233/-1	J	TDA7233	AF
⚠ IC501	VHiTA8403K/-1	J	TA8403K	AL
▲⚠ IC701	VHiSTR301301E	J	STR30130	AP
⚠ IC751	VHiKA7809Pi-1 or VHiTA7809S/-1	R	KIA7809PI	AE
⚠ IC761	VHiKA7812Pi-1 or VHiTA7812S/-1	R	KIA7812PI	AE
IC2001	RH-iX3256CEZZ	J	TMPA8701CMF142	AX
IC2040	VHiPST994C/-1	J	PST994C	AD
IC2101	VHiM24C01B/-1 or VHiM24C16B/-1	J	M24C01-BN6	AF

TRANSISTORS

You can substitute "VS2SC2462-C-1" for "VS2SD601AR/-1".

Q201	VS2SC2735//1E	J	2SC2735	AC
Q301	VS2SD601AR/-1	J	2SD601AR	AC
Q351	VS2SD601AR/-1	J	2SD601AR	AC
Q401	VS2SD601AR/-1	J	2SD601AR	AC
Q403	VS2SD601AR/-1	J	2SD601AR	AC
Q404	VS2SB709AR/-1	J	2SB709AR	AC
Q451	VS2SB709AR/-1	J	2SB709AR	AC

Ref. No.	Part No.	★	Description	Code

PWB-A:DUNTK9532WEV7 (20L-S100S)
PWB-A:DUNTK9532WEV9 (CL20S10)
PWB-A:DUNTK9532WEW1(21ML50)
MAIN UNIT (Continued)

Q501	VS2SD601AR/-1	J	2SD601AR	AC
Q601	VS2SC2655Y/-1	J	2SC2655(Y)	AE
⚠ Q602	VS2SD2586//1E	J	2SD2586	AM
Q603	VS2SC945AQ/-1	J	2SC945	AB
	or			
	VS2SC1815YW-1			
	or			
	VS2SC3198-Y-1			
Q730	VS2SD667D//-1	J	2SD667	AE
Q752	VS2SC945AQ/-1	J	2SC945	AB
	or			
	VS2SC1815YW-1			
	or			
	VS2SC3198-Y-1			
Q753	VS2SA1013//1E	J	2SA1013	AD
Q2001	VS2SD601AR/-1	J	2SD601AR	AC
Q2002	VS2SD601AR/-1	J	2SD601AR	AC
Q2060	VS2SD601AR/-1	J	2SD601AR	AC

DIODES

D51	RH-EX0611GEZZ	J	Zener Diode, 5.0V	AA
D52	RH-EX0676GEZZ	J	Zener Diode, 32V	AA
D53	RH-EX0611GEZZ	J	Zener Diode, 5.0V	AA
			(20L-S100S, CL20S10)	
D401	VHD1SS119//-1	J	Diode	AB
D402	RH-EX0092CEZZ	J	Zener Diode, 3.9V	AB
D454	RH-EX0103CEZZ	J	Zener Diode, 5.6V	AB
D455	VHD1SS119//-1	J	Diode	AB
D501	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
⚠ D502	RH-DX0131CEZZ	J	Diode	AC
D601	RH-DX0441CEZZ	J	Diode	AC
D603	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
D631	RH-EX0630GEZZ	J	Zener Diode, 9.1V	AA
D641	RH-EX0630GEZZ	J	Zener Diode, 9.1V	AA
▲⚠ D651	RH-DX0131CEZZ	J	Diode	AC
▲⚠ D652	VHD1SS119//-1	J	Diode	AB
▲⚠ D653	RH-EX0091CEZZ	J	Zener Diode, 22V	AB
	or			
	RH-EX0660GEZZ			
	or			
	RH-EX1311CEZZ			
⚠ D661	RH-DX0444CEZZ	J	Diode	AH
⚠ D701	RH-DX0154CEZZ	J	Diode	AC
⚠ D702	RH-DX0154CEZZ	J	Diode	AC
⚠ D703	RH-DX0154CEZZ	J	Diode	AC
⚠ D704	RH-DX0154CEZZ	J	Diode	AC
D730	RH-EX0636GEZZ	J	Zener Diode, 11V	AC
	or			
	RH-EX0317CEZZ			
D753	VHD1SS119//-1	J	Diode	AB
D754	VHD1SS119//-1	J	Diode	AB
D755	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
⚠ D756	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
D757	VHD1SS119//-1	J	Diode	AB
⚠ D758	RH-DX0131CEZZ	J	Diode	AC
⚠ D760	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
⚠ D761	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
⚠ D762	RH-DX0441CEZZ	J	Diode	AC
	or			
	RH-DX0110CEZZ			
D2001	VHD1SS119//-1	J	Diode	AB

PACKGED CIRCUITS

⚠ PR701	RMPTP0026CEZZ	J	Packaged Circuit	AF
X801	RCRSB0205CEZZ	J	Crystal	AF
	or			
	RCRSB0001PEZZ			

FILTERS

CF301	RFiLC0403CEZZ	J	Filter	AE
	or			
	RFiLC0029TAZZ			
CF302	RFiLC0404CEZZ	J	Filter	AF
	or			
	RFiLC0267CEZZ			
	or			
	RFiLC0007PEZZ			
CF401	RFiLC0013CEZZ	J	Filter	AE
	or			
	RFiLC0004PEZZ			
CF631	RFiLA0034CEZZ	J	Filter	AD
CF2040	RFiLC0121GEZZ	J	Filter	AD
SF201	RFiLC0405CEZZ	J	SAW Filter	AH

COILS

L201	VP-XF1R2K0000	J	Peaking 1.2µH	AB
L202	RCiLi0612CEZZ	J	IF Coil	AE
	or			
	RCiLi0588CEZZ			
L301	VP-XF8R2K0000	J	Peaking 8.2µH	AB
L302	RCiLi0613CEZZ	J	IF Coil	AE
	or			
	RCiLi0605CEZZ			
L401	VP-XF120K0000	J	Peaking 12µH	AB
L402	VP-XF100K0000	J	Peaking 10µH	AB
L406	VP-XF680K0000	J	Peaking 68µH	AB
L408	VP-XF100K0000	J	Peaking 10µH	AB
⚠ L701	RCiLF0029PEZZ	R	Coil (20L-S100S, 21ML50)	AH
	or			
	RCiLF0235CEZZ			
	or			
	RCiLF0087CEZZ			
⚠ L701	RCiLF0090CEZZ	J	Coil (CL20S10)	AM
L2040	RCiLB0159CEZZ	J	Oscillation Coil	AE

TRANSFORMERS

⚠ T601	RTRNZ0168CEZZ	J	H-Driver	AH
▲⚠ T602	RTRNF0163PEZZ	R	F.B.T	BE
	or			
	RTRNF0149PEZZ			
⚠ T701	RTRNP0527CEZZ	J	Power	AM
	or			
	RTRNP0518CEZZ			

CAPACITORS

[EL.··· Electrolytic, M-Poly.··· Metalized Polypro Film]

C51	VCEA0A1CW476M	J	47	16V	EL.	AB
C52	VCSATA1CE226K	J	22	16V	Tantalum	AD
C53	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C54	VCEA0A1HW475M	J	4.7	50V	EL.	AB
			(20L-S100S, CL20S10)			
C54	VCEA0A1HW225M	J	2.2	50V	EL.	AB
			(21ML50)			
C55	VCEA0A1CW477M	J	470	16V	EL.	AC
			(20L-S100S, CL20S10)			
C55	VCEAGA1CW108M	J	1000	16V	EL.	AD
			(21ML50)			
C201	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C202	VCKYPA1HF103Z	J	0.01	50V	Ceramic	AA
C203	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C204	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA

Ref. No.	Part No.	★	Description			Code

PWB-A:DUNTK9532WEV7 (20L-S100S)
PWB-A:DUNTK9532WEV9 (CL20S10)
PWB-A:DUNTK9532WEW1(21ML50)
MAIN UNIT (Continued)

	C205	VCEA0A1HW474M	J	0.47	50V	EL.	AB
	C206	VCEA0A1CW227M	J	220	16V	EL.	AC
	C207	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
	C208	VCEA0A1HW474M	J	0.47	50V	EL.	AB
	C209	VCKYCY1HB222K	J	2200p	50V	Ceramic	AA
	C210	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
	C302	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
	C303	VCCCCY1HH390J	J	39p	50V	Ceramic	AA
	C305	VCKYPA1HB151K	J	150p	50V	Ceramic	AA
	C306	VCKYPA1HF103Z	J	0.01	50V	Ceramic	AA
	C308	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
	C309	VCEA0A1CW227M	J	220	16V	EL.	AC
	C312	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
	C314	VCEA0A1HW225M	J	2.2	50V	EL.	AB
	C351	VCKYCY1HB562K	J	5600p	50V	Ceramic	AA
	C352	VCEA0A1CW107M	J	100	16V	EL.	AC
	C353	VCEA0A1CW337M	J	330	16V	EL.	AC
	C354	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
	C355	VCEA0A1CW226M	J	22	16V	EL.	AB
	C361	VCEAGA1CW108M	J	1000	16V	EL.	AD
	C362	VCEA0A1CW476M	J	47	16V	EL.	AB
	C403	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C404	VCCCCY1HH680J	J	68p	50V	Ceramic	AA
	C405	VCEA0A1HW335M	J	3.3	50V	EL.	AB
	C406	VCEA0A1HW335M	J	3.3	50V	EL.	AB
	C407	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
	C408	VCEA0A1CW106M	J	10	16V	EL.	AB
	C409	VCEA0A1HW105M	J	1.0	50V	EL.	AB
	C410	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
	C411	VCEAGA1CW108M	J	1000	16V	EL.	AD
	C413	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
	C414	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
	C419	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
	C420	VCCCCY1HH471J	J	470p	50V	Ceramic	AA
	C451	RC-QZA563TAYK	J	0.056	50V	Mylar	AB
	C454	VCEA0A1HW475M	J	4.7	50V	EL.	AB
	C502	VCEA0A1EW477M	J	470	25V	EL.	AD
	C504	VCKYPA2HB391K	J	390p	500V	Ceramic	AA
	C505	VCQYTA1HM473K	J	0.047	50V	Mylar	AB
	C507	VCKYPA1HB102K	J	1000p	50V	Ceramic	AA
	C508	VCEAGA1VW107M	J	100	35V	EL.	AC
	C509	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
	C510	VCEAGA1VW477M	J	470	35V	EL.	AD
	C511	VCQYTA1HM473K	J	0.047	50V	Mylar	AB
	C513	VCEACA1HC225M	J	2.2	50V	EL.	AC
	C514	VCEACA1HC225J	J	2.2	50V	EL.	AC
	C517	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
	C522	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
	C551	VCSATA1CE225K	J	2.2	16V	Tantalum	AB
	C552	VCEA0A1HW225M	J	2.2	50V	EL.	AB
	C604	VCEA0A1CW227M	J	220	16V	EL.	AC
▲⚠	C608	VCFPPD3CA742H	J	7400p	1600V	M-Poly.	AF
	C609	RC-QZA223TAYK	J	0.022	50V	Mylar	AB
	C612	VCFPPJ2EB564J	J	0.56	250V	M-Poly.	AF
	C631	VCEA0A1HW225M	J	2.2	50V	EL.	AB
	C632	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
	C633	VCEA0A1HW105M	J	1.0	50V	EL.	AB
	C652	VCEA0A1HW475M	J	4.7	50V	EL.	AB
	C653	VCEA0A1CW106M	J	10	16V	EL.	AB
	C661	VCKYPA2HB152K	J	1500p	500V	Ceramic	AA
	C662	VCEA0A1CW477M	J	470	16V	EL.	AC
⚠	C701	RC-FZ027SCEZZ	J	0.047	AC125V	Plastic	
		or					
		RC-FZ015SCEZZ					
		or					
		RC-FZ002SCEZZ					
		or					
		RC-FZ059SCEZZ					
		or					
		RC-FZ004SGEZZ					
		or					
		RC-FZ019SCEZZ					
		or					
		RC-FZ027CUMZZ					
	C702	VCKYPB2HE103P	J	0.01	500V	Ceramic	AB
	C703	VCKYPB2HE103P	J	0.01	500V	Ceramic	AB
	C704	VCKYPB2HE103P	J	0.01	500V	Ceramic	AB
⚠	C705	RC-EZ0422CEZZ	J	470	200V	EL.	AN
		or					
		RC-EZ0522CEZZ					
⚠	C706	RC-KZ0092GEZZ	J	3300p	AC250V	Ceramic	AC
		or					
		RC-KZ0311CEZZ					
	C707	VCEAGA2CW226M	J	22	160V	EL.	AD
⚠	C712	RC-EZ0638CEZZ	J	33	160V	EL.	AG
	C751	VCEA0A1VW477M	J	470	35V	EL.	AB
	C754	VCEA0A1CW337M	J	330	16V	EL.	AC
	C755	VCEA0A1CW107M	J	100	16V	EL.	AC
	C756	VCEAGA1CW108M	J	1000	16V	EL.	AD
	C757	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
⚠	C758	VCEAGA2EW106M	J	10	250V	EL.	AC
	C760	VCEAGA1CW228M	J	2200	16V	EL.	AE
	C801	RC-QZA223TAYK	J	0.022	50V	Mylar	AB
	C802	VCEA0A1HW474M	J	0.47	50V	EL.	AB
	C803	VCCCCY1HH120J	J	12p	50V	Ceramic	AA
	C804	VCEA0A1HW104M	J	0.1	50V	EL.	AB
	C805	VCEA0A1HW104M	J	0.1	50V	EL.	AB
	C806	VCEA0A1HW104M	J	0.1	50V	EL.	AB
	C807	VCCCCY1HH820J	J	82p	50V	Ceramic	AA
	C901	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
	C904	VCEA0A1HW335M	J	3.3	50V	EL.	AB
	C905	VCEA0A1HW335M	J	3.3	50V	EL.	AB
	C2001	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2002	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2021	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2022	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2023	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2024	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2040	VCEA0A1AW107M	J	100	10V	EL.	AB
	C2041	VCEA0A1HW105M	J	1.0	50V	EL.	AB
	C2051	VCCCCY1HH101J	J	100p	50V	Ceramic	AA
	C2060	RC-QZA104TAYK	J	0.1	50V	Mylar	AB
	C2061	VCKYD41HB101K	J	100p	50V	Ceramic	AA
	C2062	VCEA0A1AW107M	J	100	10V	EL.	AB
	C2402	VCCCCY1HH560J	J	56p	50V	Ceramic	AA
	C2601	VCEA0A1HW475M	J	4.7	50V	EL.	AB
	C2602	VCCCCY1HH101J	J	100p	50V	Ceramic	AA

RESISTORS

[M-Ox.··· Metal Oxide, M-Film ··· Metal Film]

RJ1	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ5	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ6	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ7	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ9	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ10	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ12	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ15	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ17	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ18	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ19	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ20	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ21	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ23	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ24	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ26	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ28	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ31	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ32	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ35	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ39	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ40	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ46	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ49	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ52	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA

PWB-A:DUNTK9532WEV7 (20L-S100S)
PWB-A:DUNTK9532WEV9 (CL20S10)
PWB-A:DUNTK9532WEW1(21ML50)
MAIN UNIT (Continued)

Ref. No.	Part No.	★	Description	Code
RJ54	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ55	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ56	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ57	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ59	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ60	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ62	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ63	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ66	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ67	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ68	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ69	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ71	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ75	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ77	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ78	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
RJ79	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
⚠ R51	VRS-VV3AB331J	J	330 1W M-Ox. (20L-S100S, CL20S10)	AA
⚠ R51	VRS-VV3DB151J	J	150 2W M-Ox. (21ML50)	AA
⚠ R52	VRS-VV3DB470J	J	47 2W M-Ox. (20L-S100S, CL20S10)	AA
⚠ R52	VRN-VV3DB1R0J	J	1.0 2W M-Film (21ML50)	AB
⚠ R53	VRS-VV3LB223J	J	22k 3.0W M-Ox.	AB
R54	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R55	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R56	VRS-CY1JF823J	J	82k 1/16W M-Ox.	AA
R57	VRS-CY1JF392J	J	3.9k 1/16W M-Ox. (20L-S100S, CL20S10)	AA
R57	VRS-CY1JF103J	J	10k 1/16W M-Ox. (21ML50)	AA
R201	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R202	VRS-CY1JF122J	J	1.2k 1/16W M-Ox.	AA
R203	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R204	VRS-CY1JF270J	J	27 1/16W M-Ox.	AA
R205	VRD-RA2BE391J	J	390 1/8W Carbon	AA
R206	VRD-RA2EE151J	J	150 1/4W Carbon	AA
R208	VRS-CY1JF391J	J	390 1/16W M-Ox.	AA
R301	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R302	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R303	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
R304	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R305	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA
R307	VRS-CY1JF333J	J	33k 1/16W M-Ox.	AA
R308	VRS-CY1JF333J	J	33k 1/16W M-Ox.	AA
R352	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R353	VRS-CY1JF4R7J	J	4.7 1/16W M-Ox.	AA
R354	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA
R361	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R364	VRS-CY1JF473J	J	47k 1/16W M-Ox.	AA
R401	VRS-CY1JF682J	J	6.8k 1/16W M-Ox.	AA
R403	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R404	VRS-CY1JF391J	J	390 1/16W M-Ox.	AA
R407	VRS-CY1JF471J	J	470 1/16W M-Ox.	AA
R409	VRS-CY1JF471J	J	470 1/16W M-Ox.	AA
R410	VRD-RA2BE563J	J	56k 1/8W Carbon	AA
R411	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
R412	VRD-RA2EE561J	J	560 1/4W Carbon	AA
R413	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R414	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R415	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R416	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R417	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R418	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA
R419	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
R423	VRS-CY1JF222J	J	2.2k 1/16W M-Ox.	AA
R426	VRS-CY1JF271J	J	270 1/16W M-Ox.	AA
R440	VRS-CY1JF821J	J	820 1/16W M-Ox.	AA
⚠ R451	VRS-SV2HC103J	J	10k 1/2W M-Ox.	AA
R452	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
R454	VRD-RA2BE274J	J	270k 1/8W Carbon	AA
R455	VRD-RA2BE392J	J	3.9k 1/8W Carbon	AA
R456	VRS-CY1JF223J	J	22k 1/16W M-Ox.	AA
R457	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R458	VRD-RA2BE474J	J	470k 1/8W Carbon	AA
R459	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R504	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R505	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R506	VRD-RA2BE683G	J	68k 1/8W Carbon	AA
R507	VRD-RA2BE104G	J	100k 1/8W Carbon	AA
R508	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R510	VRD-RM2HD1R2J	J	1.2 1/2W Carbon	AA
⚠ R511	VRN-SV2HB1R5J	J	1.5 1/2W M-Film	AB
R512	VRD-RM2HD681J	J	680 1/2W Carbon	AA
R516	VRD-RA2BE683G	J	68k 1/8W Carbon	AA
R517	VRD-RA2BE103G	J	10k 1/8W Carbon	AA
R518	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
R524	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R525	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R552	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R553	VRS-CY1JF273J	J	27k 1/16W M-Ox.	AA
R554	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
R555	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R556	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R602	VRD-RA2EE820J	J	82 1/4W Carbon	AA
⚠ R603	VRS-VV3LB220J	J	22 3.0W M-Ox.	AB
R605	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R606	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R608	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R609	VRD-RA2BE331J	J	330 1/8W Carbon	AA
⚠ R610	VRS-VV3DB391J	J	390 2W M-Ox.	AA
R620	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R621	VRS-CY1JF682J	J	6.8k 1/16W M-Ox.	AA
R631	VRS-CY1JF391J	J	390 1/16W M-Ox.	AA
R632	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA
R633	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
R634	VRD-RM2HD121J	J	120 1/2W Carbon	AA
⚠ R641	VRS-VV3AB682J	J	6.8k 1W M-Ox.	AA
R642	VRD-RA2BE821J	J	820 1/8W Carbon	AA
▲⚠ R651	VRD-RM2HD1R0J	J	1.0 1/2W Carbon	AA
▲⚠ R654	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
▲⚠ R655	VRS-CY1JF104J	J	100k 1/16W M-Ox.	AA
▲⚠ R656	VRS-CY1JF473J	J	47k 1/16W M-Ox.	AA
⚠ R659	VRN-VV3AB1R2J	J	1.2 1W M-Film	AA
⚠ R661	VRN-VV3ABR47J	J	0.47 1W M-Film	AA
⚠ R701	RR-HZ0046CEZZ or RR-DZ0047CEZZ or VRC-UB2HG275K	J	2.7M 1/2W Solid	AD
⚠ R702	VRW-KP3HC1R8K	J	1.8 5W Cement	AC
⚠ R703	VRS-KA3NG681J	J	680 7.0W M-Ox.	AF
R704	VRD-RM2HD123J	J	12k 1/2W Carbon	AA
R705	VRD-RA2EE334J	J	330k 1/4W Carbon	AA
R706	VRD-RM2HD470J	J	47 1/2W Carbon	AA
⚠ R707	VRN-VV3DB1R5J	J	1.5 2W M-Film	AB
⚠ R708	VRD-RM2HD824J	J	820k 1/2W Carbon	AA
⚠ R709	VRS-KA3NG681J	J	680 7.0W M-Ox.	AF
⚠ R711	VRS-KA3NG681J	J	680 7.0W M-Ox.	AF
⚠ R717	VRS-KA3HG3R3K	J	3.3 5W M-Ox.	AD
⚠ R730	VRN-VV3LB2R7J	J	2.7 3.0W M-Film	AB
R731	VRD-RA2EE330J	J	33 1/4W Carbon	AA
⚠ R734	VRS-KA3NG330J	J	33 7.0W M-Ox.	AE
R750	VRS-VV3AB561J	J	560 1W M-Ox.	AA
R752	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
R754	VRS-CY1JF471J	J	470 1/16W M-Ox.	AA
⚠ R755	VRS-VV3DB470J	J	47 2W M-Ox.	AA
R757	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
⚠ R758	VRS-SV2HC180J	J	18 1/2W M-Ox.	AA
R801	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R802	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R803	VRS-CY1JF182J	J	1.8k 1/16W M-Ox.	AA
R804	VRS-CY1JF182J	J	1.8k 1/16W M-Ox.	AA
R805	VRS-CY1JF182J	J	1.8k 1/16W M-Ox.	AA
R806	VRS-CY1JF333J	J	33k 1/16W M-Ox.	AA

PWB-A:DUNTK9532WEV7 (20L-S100S)
PWB-A:DUNTK9532WEV9 (CL20S10)
PWB-A:DUNTK9532WEW1(21ML50)
MAIN UNIT (Continued)

Ref. No.	Part No.	★	Description			Code
R902	VRS-CY1JF750J	J	75	1/16W	M-Ox.	AA
R905	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R906	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R924	VRS-CY1JF104J	J	100k	1/16W	M-Ox.	AA
R925	VRS-CY1JF104J	J	100k	1/16W	M-Ox.	AA
R961	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R962	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2001	VRD-RA2BE102J	J	1.0k	1/8W	Carbon	AA
R2002	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2006	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2008	VRD-RA2BE224J	J	220k	1/8W	Carbon	AA
R2009	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R2010	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R2011	VRS-CY1JF821J	J	820	1/16W	M-Ox.	AA
R2012	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R2020	VRD-RM2HD223J	J	22k	1/2W	Carbon	AA
R2022	VRD-RA2BE333J	J	33k	1/8W	Carbon	AA
R2024	VRD-RA2BE682J	J	6.8k	1/8W	Carbon	AA
R2025	VRD-RA2BE682J	J	6.8k	1/8W	Carbon	AA
R2026	VRD-RA2BE682J	J	6.8k	1/8W	Carbon	AA
R2027	VRD-RA2BE682J	J	6.8k	1/8W	Carbon	AA
R2028	VRD-RA2BE102J	J	1.0k	1/8W	Carbon	AA
R2029	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R2032	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R2033	VRD-RA2BE103J	J	10k	1/8W	Carbon	AA
R2040	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R2041	VRS-CY1JF333J	J	33k	1/16W	M-Ox.	AA
R2042	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2043	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2044	VRS-CY1JF683J	J	68k	1/16W	M-Ox.	AA
R2045	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2047	VRS-CY1JF221J	J	220	1/16W	M-Ox.	AA
R2048	VRD-RA2BE562J	J	5.6k	1/8W	Carbon	AA
R2049	VRS-CY1JF333J	J	33k	1/16W	M-Ox.	AA
R2054	VRS-CY1JF222J	J	2.2k	1/16W	M-Ox.	AA
R2055	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2060	VRS-CY1JF221J	J	220	1/16W	M-Ox.	AA
R2061	VRS-CY1JF562J	J	5.6k	1/16W	M-Ox.	AA
R2062	VRS-CY1JF183J	J	18k	1/16W	M-Ox.	AA
R2063	VRD-RA2BE222J	J	2.2k	1/8W	Carbon	AA
R2064	VRD-RA2BE332J	J	3.3k	1/8W	Carbon	AA
R2066	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2067	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2068	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2070	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R2101	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2102	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2401	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2402	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2403	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2404	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R2501	VRS-CY1JF123J	J	12k	1/16W	M-Ox.	AA
R2503	VRS-CY1JF273J	J	27k	1/16W	M-Ox.	AA
R2504	VRS-CY1JF123J	J	12k	1/16W	M-Ox.	AA
R2505	VRS-CY1JF563J	J	56k	1/16W	M-Ox.	AA
R2506	VRS-CY1JF563J	J	56k	1/16W	M-Ox.	AA
R2507	VRS-CY1JF823J	J	82k	1/16W	M-Ox.	AA
R2508	VRS-CY1JF153J	J	15k	1/16W	M-Ox.	AA
R2509	VRS-CY1JF272J	J	2.7k	1/16W	M-Ox.	AA
R2601	VRD-RA2BE331J	J	330	1/8W	Carbon	AA

SWITCHES

S2501	QSW-K0079GEZZ	J	Power	AB
S2502	QSW-K0079GEZZ	J	Vol-Down	AB
S2503	QSW-K0079GEZZ	J	Vol-Up	AB
S2504	QSW-K0079GEZZ	J	Ch-Down	AB
S2505	QSW-K0079GEZZ	J	Ch-Up	AB

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
⚠ RY701	RRLYU0036CEZZ or RRLYU0038CEZZ or RRLYU0077CEZZ	J	Relay	AM
⚠ F701	QFS-B4023CEZZ or QFS-B4021GEZZ	J	Fuse, 4A(125V)	AC
FB602	RBLN-0037CEZZ	J	Ferrite Bead	AB
FB603	RBLN-0037CEZZ	J	Ferrite Bead	AB
FH701	QFSHD1013CEZZ	J	Fuse Holder	AC
FH702	QFSHD1014CEZZ	J	Fuse Holder	AC
J903	QJAKE0159CEZZ	J	Jack, Audio IN (L)	AF
J904	QJAKE0160CEZZ	J	Jack, Audio IN (R)	AF
J905	QJAKE0158CEZZ	J	Jack, Video IN	AF
P301	QPLGN0561CEZZ	J	Plug, 5-pin (BBN)	AB
P302	QPLGN0461CEZZ	J	Plug, 4-pin (S)	AB
P401	QPLGN0561CEZZ	J	Plug, 5-pin (GBN)	AB
P601	QPLGN0603CEZZ	J	Plug, 6-pin (K)	AB
P651	QPLGN0361CEZZ	J	Plug, 3-pin	AB
P701	QPLGN0207CEZZ	J	Plug, 2-pin (M)	AA
P751	QPLGN0461CEZZ	J	Plug, 4-pin (YBN)	AB
P2001	QPLGN0561CEZZ	J	Plug, 5-pin	AB
SC3001	QSOCN0258FJ00	J	Socket, 9-pin (EA)	AF
RMC2602	RRMCU0227CEZZ or RRMCU0222CEZZ	J	R/C Receiver	AK
HM601	LX-GZ3002PEZZ	R	Screw	AB
HM602	LX-GZ3002PEZZ	R	Screw	AB
HM705	LX-GZ3001PEZZ	R	Screw	AB
HM706	LX-GZ3001PEZZ	R	Screw	AB
HM707	LX-GZ3001PEZZ	R	Screw	AB
HM708	LX-GZ3001PEZZ	R	Screw	AB
HM711	LX-GZ3001PEZZ	R	Screw	AB
HM712	LX-GZ3001PEZZ	R	Screw	AB
HM713	LX-GZ3001PEZZ	R	Screw	AB
HM714	LX-GZ3001PEZZ	R	Screw	AB
HM715	LX-GZ3001PEZZ	R	Screw	AB
HM716	LX-GZ3001PEZZ	R	Screw	AB
HM717	LX-GZ3001PEZZ	R	Screw	AB
HM718	LX-GZ3001PEZZ	R	Screw	AB
HM719	LX-GZ3001PEZZ	R	Screw	AB
HM720	LX-GZ3001PEZZ	R	Screw	AB
HM722	LX-GZ3002PEZZ	R	Screw	AB
HM724	LX-GZ3002PEZZ	R	Screw	AB
HM726	LX-GZ3002PEZZ	R	Screw	AB
HM729	LX-GZ3001PEZZ	R	Screw	AB
HM730	LX-GZ3001PEZZ	R	Screw	AB
HM732	LX-GZ3001PEZZ	R	Screw	AB
HM733	LX-GZ3001PEZZ	R	Screw	AB
HM734	LX-GZ3002PEZZ	R	Screw	AB
HM737	LX-GZ3002PEZZ	R	Screw	AB
HM739	LX-GZ3002PEZZ	R	Screw	AB
HM740	LX-GZ3002PEZZ	R	Screw	AB
HM741	LX-GZ3002PEZZ	R	Screw	AB
HM742	LX-GZ3002PEZZ	R	Screw	AB
HM743	LX-GZ3002PEZZ	R	Screw	AB
RDA602	PRDAR0216PEFW	R	Heat Sink, for Q602	AE
RDA701	PRDAR0238PEFW	R	Heat Sink, for IC701	AN
TP701	QLUGP0102PEZZ	R	Lug	AA
RDA501	PRDAR0103GJFW	X	Heat Sink	
	PZETM0016CEZZ	J	Insulator	AB
	LX-BZ3049GEFD	J	Screw	AA
	LX-BZ3100CEFD	J	Screw	AA
	LX-BZ3100CEFD	J	Screw	AA
	LX-TZ3004CEFD	J	Screw	AA

PWB-B : DUNTK9533WEV7
CRT UNIT

TRANSISTORS

Ref. No.	Part No.	★		Description	Code
Q852	VS2SC2229O/1E	J	2SC2229		AD
Q854	VS2SC2229O/1E	J	2SC2229		AD
Q856	VS2SC2229O/1E	J	2SC2229		AD
Q881	VS2SA1266-Y-1	J	2SA1266		AA
	or				
	VS2SA1015-Y-1				

DIODES

You can substitute "RH-DX0045GEZZ" and "VHD-DX0446CEZZ" for "VHD1SS119//-1".

Ref. No.	Part No.	★		Description	Code
D881	VHD1SS119//-1	J	Diode		AB
D882	VHD1SS119//-1	J	Diode		AB
D885	VHD1SS119//-1	J	Diode		AB

COIL

Ref. No.	Part No.	★		Description	Code
L851	VP-DF151K0000	J	Peaking 150µH		AB

CAPACITORS

[EL.··· Electrolytic]

Ref. No.	Part No.	★					Code
C851	VCCCCY1HH271J	J	270p	50V	Ceramic		AA
C852	VCCCCY1HH271J	J	270p	50V	Ceramic		AA
C853	VCCCCY1HH271J	J	270p	50V	Ceramic		AA
C854	RC-KZ0029CEZZ	J	0.01	1.4kV	Ceramic		AC
C881	VCEA0A1CW106M	J	10	16V	EL.		AB
C883	VCEA0A1CW336M	J	33	16V	EL.		AB

RESISTORS

[M-Ox.··· Metal Oxide]

Ref. No.	Part No.	★					Code
R851	VRS-CY1JF470J	J	47	1/16W	M-Ox.		AA
R852	VRD-RA2BE221J	J	220	1/8W	Carbon		AA
R853	VRS-CY1JF121J	J	120	1/16W	M-Ox.		AA
⚠ R857	VRS-VV3AB123J	J	12k	1W	M-Ox.		AA
R858	VRD-RM2HD332J	J	3.3k	1/2W	Carbon		AA
R859	VRD-RA2BE470J	J	47	1/8W	Carbon		AA
R860	VRS-CY1JF221J	J	220	1/16W	M-Ox.		AA
R861	VRS-CY1JF121J	J	120	1/16W	M-Ox.		AA
⚠ R865	VRS-VV3AB123J	J	12k	1W	M-Ox.		AA
R866	VRD-RM2HD332J	J	3.3k	1/2W	Carbon		AA
R867	VRS-CY1JF470J	J	47	1/16W	M-Ox.		AA
R868	VRD-RA2BE221J	J	220	1/8W	Carbon		AA
R869	VRS-CY1JF121J	J	120	1/16W	M-Ox.		AA
⚠ R873	VRS-VV3AB123J	J	12k	1W	M-Ox.		AA
R874	VRD-RM2HD332J	J	3.3k	1/2W	Carbon		AA
R881	VRS-CY1JF561J	J	560	1/16W	M-Ox.		AA
R882	VRS-CY1JF391J	J	390	1/16W	M-Ox.		AA
R883	VRD-RA2BE561J	J	560	1/8W	Carbon		AA
R884	VRS-CY1JF152J	J	1.5k	1/16W	M-Ox.		AA
R886	VRS-CY1JF431J	J	430	1/16W	M-Ox.		AA
R887	VRS-CY1JF470J	J	47	1/16W	M-Ox.		AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★		Description	Code
P851	QPLGN0561CEZZ	J	Plug, 5-pin (GBN)		AB
P852	QPLGN0461CEZZ	J	Plug, 4-pin (YBN)		AB
SC851	QSOCV0929CEZZ	J	CRT Socket		AM

PWB-E : DUNTK9531WEV7
MTS MODULE UNIT

INTEGRATED CIRCUITS

Ref. No.	Part No.	★		Description	Code
IC352	VHiTDA7233/-1	J	TDA7233		AF
IC3001	VHiCXA2074Q-1	J	CXA2074Q		AY

TRANSISTOR

Ref. No.	Part No.	★		Description	Code
Q352	VS2SD601AR/-1	J	2SD601AR		AC

CAPACITORS

[EL.··· Electrolytic]

Ref. No.	Part No.	★					Code
C315	VCEA0A1HW225M	J	2.2	50V	EL.		AB
C356	VCKYCY1HB562K	J	5600p	50V	Ceramic		AA
C357	VCEA0A1CW107M	J	100	16V	EL.		AC
C358	VCEA0A1CW337M	J	330	16V	EL.		AC
C359	VCKYCY1EF104Z	J	0.1	25V	Ceramic		AA
C360	VCEA0A1CW226M	J	22	16V	EL.		AB
C365	VCEAGA1CW108M	J	1000	16V	EL.		AD
C3001	VCE9GA1HW475M	J	4.7	50V	EL.(N.P)		AB
C3002	VCKYCY1HB562K	J	5600p	50V	Ceramic		AA
C3003	RC-QZA123TAYK	J	0.012	50V	Mylar		AB
C3004	VCEA0A1HW105M	J	1.0	50V	EL.		AB
C3005	VCEA0A1HW475M	J	4.7	50V	EL.		AB
C3006	VCEA0A1HW106M	J	10	50V	EL.		AB
C3007	VCEA0A1HW475M	J	4.7	50V	EL.		AB
C3008	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3009	VCEA0A1CW227M	J	220	16V	EL.		AC
C3010	VCE9GA1HW475M	J	4.7	50V	EL.(N.P)		AB
C3011	VCEA0A1HW475M	J	4.7	50V	EL.		AB
C3012	VCE9GA1HW475M	J	4.7	50V	EL.(N.P)		AB
C3013	VCKYCY1HB272K	J	2700p	50V	Ceramic		AA
C3014	RC-QZA473TAYK	J	0.047	50V	Mylar		AB
C3015	VCSATA1CE335K	J	3.3	16V	Tantalum		AC
C3016	VCE9GA1HW475M	J	4.7	50V	EL.(N.P)		AB
C3017	VCSATA1CE106K	J	10	16V	Tantalum		AD
C3018	VCEA0A1HW105M	J	1.0	50V	EL.		AB
C3023	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3024	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3025	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3026	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3027	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3028	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3029	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA
C3030	VCKYCY1HF103Z	J	0.01	50V	Ceramic		AA

RESISTORS

[M-Ox.··· Metal Oxide]

Ref. No.	Part No.	★					Code
RJ2	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
RJ3	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
RJ4	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
RJ6	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
RJ7	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
RJ8	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
RJ9	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
R305	VRS-CY1JF000J	J	0	1/16W	M-Ox.		AA
R355	VRS-CY1JF333J	J	33k	1/16W	M-Ox.		AA
R356	VRS-CY1JF332J	J	3.3k	1/16W	M-Ox.		AA
R357	VRS-CY1JF4R7J	J	4.7	1/16W	M-Ox.		AA
R358	VRS-CY1JF152J	J	1.5k	1/16W	M-Ox.		AA
R362	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.		AA
R3001	VRS-CY1JF221J	J	220	1/16W	M-Ox.		AA
R3002	VRS-CY1JF221J	J	220	1/16W	M-Ox.		AA
R3003	VRS-CY1JF105J	J	1.0M	1/16W	M-Ox.		AA
R3004	VRS-CY1JF104J	J	100k	1/16W	M-Ox.		AA
R3005	VRS-CY1JF623J	J	62k	1/16W	M-Ox.		AA
R3007	VRS-CY1JF332J	J	3.3k	1/16W	M-Ox.		AA
R3008	VRS-CY1JF302J	J	3.0k	1/16W	M-Ox.		AA
R3010	VRS-CY1JF392J	J	3.9k	1/16W	M-Ox.		AA
R3011	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.		AA
R3012	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.		AA

Ref. No.	Part No.	★	Description	Code

PWB-E : DUNTK9531WEV7
MTS MODULE UNIT (Continued)

MISCELLANOUS PARTS

P351	QPLGN0561CEZZ	J	Plug, 5-pin (BBN)	AB
P3001	QPLGN0241FJ00	J	Plug, 9-pin (EA)	AG

MISCELLANEOUS PARTS

⚠ ACC701	QACCD3064CESA	M	AC Cord	AM
	or			
	QACCD3060CESA			
	QCNW-0114GJZZ	X	Connecting Cord	
	QCNW-2111PEZZ	R	Connecting Cord	AF
	QCNW-2160PEZZ	R	Connecting Cord	AG
	QCNW-2208PEZZ	R	Connecting Cord	AF
SP1	VSP0080PBK98A	M	Speaker (L)	AG
	or			
	VSP0080P-E98S			
SP2	VSP0080PBK98A	M	Speaker (R)	AG
	or			
	VSP0080P-E98S			

SUPPLIED ACCESORRIES

TGAN-0001GJZZ	X	Guarantee Card (20L-S100S, CL20S10)	
TiNS-6566GJZZ	X	Operation Manual (20L-S100S)	
TiNS-6568GJZZ	X	Operation Manual (CL20S10)	
TiNS-6570GJZZ	X	Operation Manual (21ML50)	
RRMCG1324CESA	M	Infrared R/C Unit (20L-S100S, CL20S10)	AT
RRMCG1339CESA	M	Infrared R/C Unit (21ML50)	AT
QANTR0018PEZZ	M	Rod Antenna (21ML50)	AQ
RUNTK0165CEZZ	M	Antenna Adaptor (21ML50)	AG

Ref. No.	Part No.	★	Description	Code

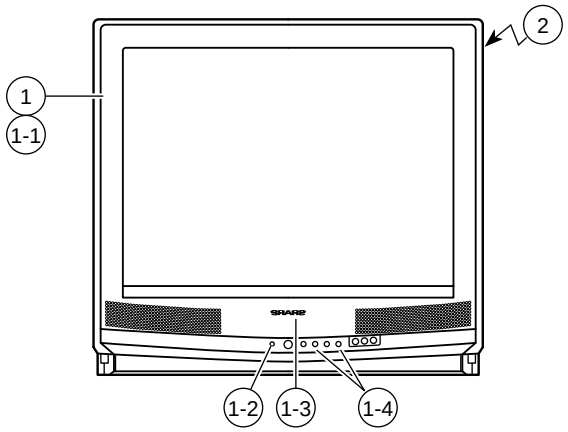
PACKING PARTS
(NOT REPLACEMENT ITEM)

	SPAKC0005GJZZ	–	Packing Case (20L-S100S)	—
	SPAKC0106GJZZ	–	Packing Case (CL20S10)	—
	SPAKC0105GJZZ	–	Packing Case (21ML50)	—
	SPAKP0102GJZZ	–	Wrapping Paper	—
	SPAKX0004GJZZ	–	Buffer Material	—
	SSAKA0101GJZZ	–	Polyethylene Bag	—

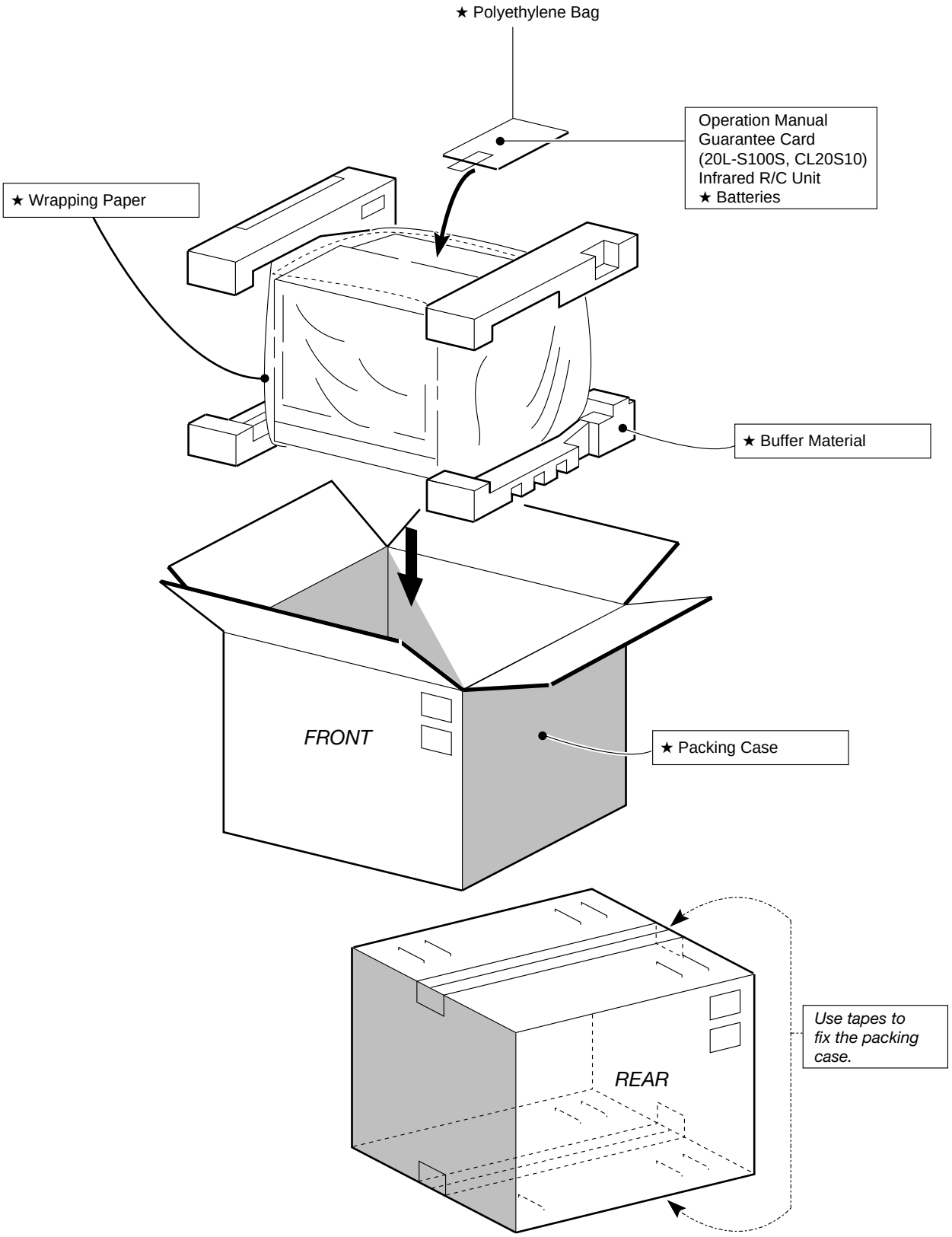
CABINET PARTS

1	CCABA0005WEH0	X	Front Cabinet Ass'y (20L-S100S, CL20S10)	
1	CCABA0105WEH0	X	Front Cabinet Ass'y (21ML50)	
1-1	*Not Available*	–	Front Cabinet	—
1-2	GCOVA0004GJSA	X	Cover for R/C	
1-3	HBDGB1001GJSA	X	Badge, "SHARP"	
1-4	JBTN-0004GJSA	X	Button	
2	GCABB0004GJKA	X	Rear Cabinet	

CABINET PARTS LOCATION



PACKING OF THE SET



★ MARK : Not Replacement Items.

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